

79TH CONGRESS }
1st Session }

SENATE

{ DOCUMENT
No. 88 }

POST-WAR IMPORTS AND DOMESTIC PRODUCTION
OF MAJOR COMMODITIES

LETTERS

FROM THE

CHAIRMAN OF THE
UNITED STATES TARIFF COMMISSION

TRANSMITTING

A REPORT OF THE UNITED STATES TARIFF
COMMISSION IN RESPONSE TO SENATE
RESOLUTION NO. 841 (78TH CONGRESS)



APRIL 6 (legislative day, MARCH 16), 1945.—Referred to the
Committee on Finance and ordered to be printed

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1945

[Submitted by Mr. GEORGE]

IN THE SENATE OF THE UNITED STATES,
April 6 (legislative day, March 16), 1945.

Ordered, That the report of the United States Tariff Commission, relative to Post-War Imports and Domestic Production of Major Commodities, transmitted to the Senate today in partial response to Senate Resolution 341, Seventy-eighth Congress, be referred to the Committee on Finance, and that when the additional data have been received, the reports in their entirety be printed as a Senate document.

Attest:

LESLIE L BIFFLE,
Secretary.

LETTERS OF TRANSMITTAL

April 5, 1945.

THE PRESIDENT OF THE SENATE,
United States Senate.

DEAR MR. PRESIDENT: I have the honor to transmit herewith certain information in partial response to Senate Resolution 341, Seventy-eighth Congress, agreed to on December 8, 1944.

The material forwarded at this time consists of the General Introduction to the report and separate sections for the following schedules of the Tariff Act of 1930.

Schedule 2—Earths, Earthenware, and Glassware.

Schedule 6—Tobacco and Manufactures.

Schedule 13—Rayon and Manufactures.

If, as I understand, arrangements are made to have this material printed, the data with respect to other schedules of the tariff act will be forwarded directly to the Printing Office in order that a printed report may be available to the Members of the Senate shortly after all of the material has been completed.

Sincerely yours,

OSCAR B. RYDER, *Chairman.*

April 26, 1945.

THE PRESIDENT OF THE SENATE,
United States Senate.

DEAR MR. PRESIDENT: I have the honor to transmit herewith material supplemental to that previously submitted in response to Senate Resolution 341, 78th Congress, agreed to on December 8, 1944.

The new material forwarded at this time consists of items in the following schedules of the Tariff Act of 1930:

Schedule 1—Chemicals, Oils, and Paints.

Schedule 4—Wood and Manufactures.

Schedule 8—Spirits, Wines, and Other Beverages.

Schedule 10—Flax, Hemp, Jute, and Manufactures.

Schedule 12—Silk Manufactures.

Schedule 14—Papers and Books.

The remainder of the material required by the Resolution will be completed in the very near future.

Sincerely yours,

OSCAR B. RYDER, *Chairman.*

April 28, 1945.

THE PRESIDENT OF THE SENATE,
United States Senate.

DEAR MR. PRESIDENT: I have the honor to transmit herewith the final installment of the report prepared in response to Senate Resolution 341, 78th Congress, agreed to on December 8, 1944.

The material sent at this time consists of the sections covering items in the following schedules of the Tariff Act of 1930:

- Schedule 3—Metals and Manufactures.
- Schedule 5—Sugar, Molasses and Manufactures.
- Schedule 7—Agricultural and Fishery Products.
- Schedule 9—Cotton Manufactures.
- Schedule 11—Wool and Manufactures.
- Schedule 15—Sundries.

Items on the free list of the tariff act have been distributed among the 15 schedules which cover related dutiable articles.

Sincerely yours,

OSCAR B. RYDER, *Chairman.*

May 19, 1945.

THE PRESIDENT OF THE SENATE,
United States Senate.

DEAR MR. PRESIDENT: I am enclosing a summary of the Commission's report in response to Senate Resolution 341. It is to be inserted in the printed edition following the General Introduction and immediately preceding the sections on individual commodities or groups of commodities.

This summary includes tables which total all the estimates made in the report regarding domestic production and imports in the post-war long term under each of the assumptions made in the Resolution. It also includes textual comments explaining how the totals were made and setting forth the qualifications to which they are subject.

Sincerely yours,

OSCAR B. RYDER, *Chairman.*

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POST-WAR IMPORTS AND DOMESTIC PRODUCTION OF MAJOR COMMODITIES

GENERAL INTRODUCTION

This report is in response to Senate Resolution 341, 78th Congress, Second Session. For an understanding of the sections on individual commodities, it is necessary to consider the terms of the resolution and the general problems encountered in preparing sections under it.

SENATE RESOLUTION 341 AND ITS INTERPRETATION

Requirements of Senate Resolution 341

Senate Resolution 341 directs the Tariff Commission to examine all articles which were imported in 1939 to a value in excess of \$100,000, or which, in the judgment of the Commission, are likely to be imported in excess of that value after the war. With respect to each such article the Commission is requested, insofar as it may prove practicable, to report to the Senate as follows:

I. (a) The quantity and value of United States imports in 1939, and (b) the quantity and value of United States production, consumption, and exports in 1939 of the like, similar, or competitive article, (c) the ratio of imports to domestic consumption, and (d) the number of persons engaged in the production thereof; and

II. The probable short- and long-term effects, with specific estimates wherever possible, of the changes in conditions which have resulted from the war upon the quantity and value of imports, and upon the production, the number of persons engaged in production, the consumption and the exports of the like, similar, or competitive article, under each of the following assumptions:

1. That national income is the same as in 1939 and that duties are—

- (a) The same as on July 1, 1939.
- (b) 50 percent lower than on that date.
- (c) 50 percent higher than on that date.

2. That national income is 75 percent greater than in 1939 and that duties are—

- (a) The same as on July 1, 1939.
- (b) 50 percent lower than on that date.
- (c) 50 percent higher than on that date.

Interpretation of Certain Terms Used in the Resolution

In order to prepare the reports required by Senate Resolution 341, the Tariff Commission has found it necessary to make the following assumptions as to the meaning of terms used in the resolution:

(1) The *post-war short term* is a period long enough after the actual cessation of hostilities to permit fairly full conversion from wartime to peacetime production, but not long enough to permit the reestablishment of "normal" peacetime con-

ditions of production and trade, and particularly not long enough to permit the full restoration of industries in war-torn foreign countries, nor even to permit United States industries to catch up with all the backlog of civilian demand created by war shortages. The second year following the end of hostilities has been assumed to be representative of this intermediate period.

(2) The *post-war long term* refers to the period, say, from 1951 or 1952 through 1955 or 1956. Since wide annual fluctuations in production, imports, and exports of many individual commodities may occur under special and temporary circumstances, all estimates have been based on an average year in that period. Moreover, since the magnitude of the population of the United States affects consumption, production, and imports, and, since population increases significantly each year, the population forecast by the Bureau of the Census for 1953, the midyear of 1951-55, has been taken as representative of the average year of this period. The estimated population for 1953 is approximately 10 percent greater than that in 1939.

(3) The term *national income* means (a) not total national income but *per capita* national income (under which interpretation account must be taken of increase in population in determining total national income); and (b) income in dollars without any corrections for changes in the average level of prices.

Assumptions as to United States Prices in the Post-War Periods

Under the foregoing interpretation of the term "national income," it is necessary to make the following assumptions as to the general level of United States prices in the post-war short- and long-term periods:

1. That in the short-term period average prices in the United States will be at the 1943 level, which was 34 percent higher than in 1939.

2. That in the long-term period, with national income at the 1939 level, average United States prices will also be at the 1939 level.

3. That in the long-term period, with national income 75 percent above the 1939 level, average prices in the United States will be at about the 1941 level, or approximately 13 percent higher than in 1939.

The trend of prices of many individual commodities may, of course, differ materially from that of all commodities combined. So far as data are available on which to judge post-war prices of particular articles, the forecasts of values have been adjusted.

Total National Income in the Post-War Long-Term Period

Under these interpretations of Senate Resolution 341, total national income in the long-term period, for which the year 1953 is taken as representative, would be as follows:

(1) Under the assumption that *per capita* national income in the long-term period will be the same as in 1939, total national income, owing to a 10-percent increase in population, will be 110 percent of that in 1939, or about 78 billion dollars compared with about 71 billion.

(2) Under the assumption that *per capita* national income in the long-term period will be 175 percent of the 1939 figure, total national income, owing to the 10-percent increase in population, will be 192.5 percent (110 percent multiplied by 175 percent) of the income in 1939, or about 136 billion dollars compared with about 71 billion. This represents an increase of 65 billion over 1939. Of this increase, about 7 billion dollars is assumed to result from a 10-percent increase in population; about 43 billion from a quantitative increase of 55 percent in the per capita consumption of goods and services; and the remaining 15 billion from the assumed 13-percent increase in prices to which reference has been made.

**ASSUMPTIONS AS TO POST-WAR CONDITIONS NOT COVERED BY
ASSUMPTIONS IN SENATE RESOLUTION 341**

So numerous, even under normal peacetime conditions, are the factors involved in the effect of change in national income and in tariff rates on the future course of United States consumption, production, imports, and exports of particular commodities that any quantitative predictions are extremely hazardous and subject to a wide margin of error. Estimates of values introduce additional uncertainties about price movements, which are also influenced by many complex causal factors. These difficulties are further intensified by uncertainties about the political, economic, and social effects of a prolonged and exhausting war. The estimates called for in the resolution, if they are to have any value at all, must be based on stated assumptions as to these major uncertainties and must be regarded as contingent on the realization of such assumptions. As only a very few of these uncertainties are covered by the interpretative assumptions already set forth, it has been necessary to make further assumptions, most of which are more or less arbitrary, and some of which will probably not be borne out by future events. Some of these assumptions relate to the international post-war economic situation, some to economic policies of leading foreign countries, others to United States policies, and still others to special conditions affecting a particular commodity or group of commodities.

International Monetary, Price, and Cost Relationships***Post-war exchange value of the currencies of the world.***

A matter of supreme importance about which there is great uncertainty—one that might well upset all advance calculations—concerns relative international currency values and relative price and cost levels in the various countries of the world during the post-war period. The Commission has found it necessary to assume that the currencies of the world will be stabilized at the same relative values as existed in 1939. Obviously, this assumption is practically certain to prove incorrect, at least for some countries. Nevertheless, it is the only workable assumption, for it would be out of the question to attempt to predict now what will be the actual value of any given currency 8 or 10 years hence. Before the war the German currency had various values in different foreign-trade transactions. The assumption is made that after the war there will be but one exchange value of the currency of each country, and that this value will have about the same relation to the value of the United States dollar as prevailed in pre-war transactions between that country and the United States.

Exchange controls.

During the 1930's (and, of course, still more during the war years) the governments of many countries exercised more or less rigid control over foreign-exchange transactions. These controls often greatly affected commodity trade. They were frequently exercised in such a way as to discriminate between countries. It is assumed that most exchange controls will have been eliminated in the post-war long-term period, and that those which are continued will be exercised in a non-discriminatory manner.

International price and cost levels.

For the same reasons and with the same qualifications as those which apply to the exchange values of currencies, it is assumed that the relation between general price and cost levels in the different countries of the world will be about the same in the post-war long term as in 1939. In general, this assumption extends to the comparative prices and costs of individual domestic articles and like or similar foreign articles. If, however, technical, industrial, or other changes are known to affect materially the competitive positions of particular foreign and domestic articles, those changes are taken into account in the sections on individual commodities.

Industries in War-Torn Countries

It is assumed that, by the post-war long term, industries, particularly export industries, in all war-torn countries except Germany and Japan, will have been restored to about their pre-war competitive position, especially in relation to United States industries making like or similar products. It is further assumed that all direct war industries in both Germany and Japan will be suppressed. Beyond that, no general assumption is made regarding industries in those countries in the post-war period. However, in the sections on those individual commodities in which either Germany or Japan were important pre-war competitors in the United States and world markets, the section on each commodity considers the possibility of revived competition after the war. For each commodity the estimates are made on a stated assumption or on stated alternative assumptions.

Government Participation in International Trade

Before, and especially during, the war direct government participation in foreign trade greatly increased, and there is much uncertainty as to how far such government participation will persist after the war. For purposes of Senate Resolution 341, it has been assumed that, in general, international trade in the post-war long term will be in private hands without any direct government participation, although it is recognized that in the Soviet Union, and perhaps a few other countries, foreign trade will be wholly or largely a government affair.

Cartel Arrangements

One of the greatest difficulties in predicting the quantity and value of imports into the United States, under different assumptions as to rates of duty, arises from the possible influence of international cartel arrangements and intercorporate relationships on the foreign trade in certain commodities. No general assumption is made regarding these arrangements in the post-war period. If it seems possible that these arrangements may affect trade in a particular commodity, the section on that commodity points out this possibility and the further possibility that they may nullify the effect of changes in duties on imports. Moreover, for some commodities, an assumption, or alternative assumptions, regarding cartel arrangements and policies are made in order to make estimates possible.

Other Uncertainties

Although many other variable, and often unpredictable, factors may influence post-war production and trade, no general assumptions are made regarding them. Problems relating to each commodity or group of commodities are considered separately. Examples are questions relating to international commodity agreements among governments, surplus productive facilities created by war expansion of certain industries, and agricultural price-support programs which may result in higher prices here than abroad. Regarding political uncertainties, no suppositions are made, except that enemy-occupied countries will be economically restored, and that a world-wide state of peace will be maintained.

SCOPE, NATURE, AND LIMITATIONS OF THE ESTIMATES

Scope

This report covers all commodities the imports of which either had in 1939 a value exceeding \$100,000, or may possibly have a value exceeding that figure in the post-war period, with the exception of articles covered by certain so-called basket classifications in the import statistics. A list of the basket classifications for which estimates are not made is included under each schedule, together with the value of the imports thereof in 1939.

The Senate resolution directs the Commission to report the probable short- and long-term effects of war changes on imports, production, consumption, exports, and employment in the post-war period with specific estimates wherever possible. The Commission has made every effort to comply with this direction. For very nearly all the commodities, estimates are made regarding imports, production, and consumption. For many articles it was impossible to present estimates of exports or employment. Frequently, no data of pre-war employment for particular commodities are available. Data are not available on pre-war exports of some, and there is no basis for estimating post-war exports of others. Future conditions are so uncertain for a few commodities that no estimates are presented for imports and production for the domestic market although estimates of consumption are given.

So far as data for both quantities and values are available for the pre-war period, the estimates for the post-war period cover both quantities and values. For many articles, however, only the data on values are available.

Comparability of Statistics of Production, Imports, and Exports

For most commodities statistics of domestic production have the same general scope as the statistics of imports, although the composition of the imports, as regards sizes, types, grades, and price brackets, often differs greatly from that of the domestic production. For some classifications, however, the statistics of production either do not exist or are not at all comparable in scope with those of imports; for these, rough estimates of production have been made on an approximately comparable basis. Similarly, a good many statistics on exports are not closely comparable with those on imports of the same product; statistics on some classes of imports are much more or much less detailed than those on exports.

Relation of Post-War Estimates to 1939 Data

In accordance with the provisions of the resolution, the section concerning each article gives the available data for 1939 regarding consumption, production, imports, exports, and employment. However, the year 1939 was not representative of the pre-war period as regards some of these data. For example, defense activities, and (in the latter part of the year) actual war activities, greatly affected the production and trade of some commodities in 1939. The data on a good many other commodities in that year were not representative for other reasons, such as weather favorable or unfavorable for crops. As a basis for post-war estimates, therefore, the Commission has frequently chosen the data for some more representative pre-war year, or the average data for a group of pre-war years. Each individual section sets forth the pre-war basis for the post-war estimates.

Factors Affecting Consumption, Production, Trade, and Employment in the Post-War Period**Prices.**

It is presumable that the Senate, in adopting Resolution 341, was particularly interested in the values of production, imports, and exports in the post-war period, especially since data for different commodities can be combined into group totals only in terms of value. To estimate a given value, of course, requires an estimate of both quantity and price. Uncertainties regarding the future course of prices of particular commodities are thus added to the uncertainties regarding future changes in quantities.

In estimating data for the long-term post-war period on the assumption of national income the same as in 1939, the Commission has assumed that the general level of prices will be about the same as in 1939. For most individual commodities, therefore, estimates of values under that assumption are based on prices in the United States and in the foreign countries from which imports come, substantially the same as before the war. Special factors, however, may make prices, domestic or foreign, for certain articles higher or lower than before the war. For example, if during the period between the two wars there was a general downward, or upward, trend in the price of a given commodity, it is ordinarily assumed in the individual sections that this trend will continue, so that prices in the long-term post-war period will be somewhat lower, or higher, than before the war.

In making estimates on the basis of a national income in the post-war period 75 percent higher than in 1939, it is assumed by the Commission that the general price level will be from 10 to 15 percent higher than before the war. Here again, however, many individual commodities are likely to depart from the general trend. High income tends to increase the demand for some commodities much more than that for others, and this difference with respect to demand is likely to be reflected in differences with respect to price changes. Commodities differ also as regards the availability of supplies to meet a strong demand, with consequent different effects on prices.

If imports of any dutiable commodity have supplied or may supply a substantial part of the amount consumed, consideration has to be given to the effect of a reduction or increase of 50 percent in the rate

of duty on both the domestic price of the commodity and the foreign price of imports. For such a commodity a reduction in the duty, would probably usually lower the duty-paid price of the imports, and might consequently lower the price of the domestic product. Part of the effect of a reduction in duty, however, might be reflected in an increase in the foreign price of the imported article. The extent of the effect both on domestic prices and on foreign prices is obviously very difficult to estimate. Similar considerations apply to estimates of domestic and foreign prices based on the assumption of a rate of duty 50 percent higher than in 1939.

Consumption.

The factors affecting the quantity of consumption of the several commodities are broadly similar to those affecting their prices, and the assumptions made in estimating consumption are similar to those already mentioned in the discussion of prices. For many commodities it is assumed that if national income in the long-term post-war period is at the 1939 level, the per capita consumption will be approximately the same as before the war; the estimates must, of course, allow for the increase in population, taken as about 10 percent. For many individual commodities, however, special causal factors, often manifest in pre-war trends, may result in a per capita consumption greater, or smaller, than before the war.

In estimating consumption on the assumption of a national income 75 percent higher than in 1939, careful consideration has been given to the nature of the demand for different commodities, especially to the degree of elasticity in demand with changes in income. Per capita consumption of many articles which are virtual necessities would be but little greater under the assumed high national income than under income as in 1939. Other commodities commonly regarded as necessities, however, are bought in considerably larger quantities in good than in bad times. At the other extreme, per capita consumption of luxuries and capital goods (whether producers' capital or consumers' capital) is likely in general to be much greater if income is high than if income is low. Each commodity, however, has to be studied by itself. Consumption of some commodities might be as much as 100 percent greater than on the lower income level. Post-war consumption of some commodities, on the assumption of high income, may be limited by the lack of sufficient supplies, whether in this country or in foreign sources of imports, to meet the strong demand.

If imports of a commodity have constituted or may constitute a substantial or large part of the amount consumed, consideration has to be given to the possible effect on total consumption which might follow a reduction, or an increase, of 50 percent in the rate of duty. A reduction in the duty that lowered the price of a commodity in the United States (whether by the full amount of the reduction in duty or by a part thereof) would tend to increase the consumption, whereas an increase in the duty that raised the price would tend to reduce consumption. The effects on consumption would vary widely for different commodities, and estimates of consumption for many are necessarily subject to a wide margin of error.

Imports.

The factors to be taken into consideration in estimating post-war imports of dutiable articles, on the assumption of rates of duty the same as in 1939, are similar to those relating to duty-free commodities. In both cases the presumption is usually, at least on the assumption of national income the same as in 1939, that the ratio of imports to consumption in the post-war period will be about the same as in pre-war years. In making estimates, however, account has been taken of factors affecting individual commodities—factors which may already have been manifest before the war or which seem likely to appear in the post-war period. For example, if the known reserves of a given mineral in the United States have been much depleted during recent years, especially during the war, imports may constitute a larger proportion of the amount consumed after the war than before the war, even with no change in duty. Conversely, the recent development of new industries in the United States, especially during the war, may cause imports to be smaller than before the war; cigarette paper and rubber may be mentioned.

Usually the effects of an increase of 75 percent in the national income on the imports of a given commodity—if free of duty or if the duty remains the same as in 1939—are likely to be about the same as the effects upon the total consumption; in other words, the share of imports in the consumption is likely to be about the same on both income assumptions. There are, however, important exceptions to this statement. For example, if the imports under a given category partake more of the character of luxuries than does the domestic production, a marked increase in national income would tend to raise the share of imports in the consumption. On the other hand, an increase in income in foreign countries, which it is assumed would accompany high income in the United States, may actually lessen the quantity of some commodities which foreigners are willing to release for import into this country.

The effects of a reduction of 50 percent in the rate of duty on imports of dutiable articles naturally vary widely. If the rate of duty is already low, such a reduction may have little effect on the quantity of imports, though even here much may depend on the nature of the commodity and the profit margin under which domestic and foreign producers normally operate. Moreover, if imports of commodities taking the higher duties have supplied a very small proportion of the amount consumed, a reduction of 50 percent may not be sufficient to cause a substantial increase in imports. Again, although the lowering of the duty may increase some previously insignificant imports by a large percentage, they may still constitute only a small part of the amount consumed, and thus have only a small effect on the volume of domestic production. In contrast to these commodities, others under a reduced duty may be imported in much greater quantities, both relatively and absolutely, with the result that domestic production, at a given level of demand, will be materially smaller than with an unchanged duty.

The effects of a reduction in duty on the quantity of imports may depend in considerable part on the relative composition of the imports and the domestic production with respect to grades, types, and price brackets. If in the pre-war period imports had been confined to very high priced articles, a reduction of 50 percent in the duty might permit

goods of somewhat lower price to enter, with a resultant marked increase in total imports. Such increase is, of course, particularly likely if the duty is specific and is at the same rate per unit of quantity over a wide range of grades of different price levels; a marked reduction of such a specific duty may, in some instances, permit large quantities of imports to enter in a price range from which they were previously largely or wholly excluded.

From what has been said, it is evident that the ratio by which a 50-percent reduction in duties will increase imports varies greatly with different commodities, and estimates of the effect must be subject to a rather wide margin of error. Similar considerations hold with respect to the effect of a 50-percent increase in the rate of duty. The effect may be very small or it may be marked, and an estimate of it requires careful consideration of all circumstances.

Estimates of post-war imports, under the several assumptions, relate to quantities where pre-war data for quantities are available and, in all cases, to value, that is, to the foreign value. As already pointed out, changes in the rate of duty may affect not only the quantities of imports but the prices of the goods in the countries from which imported. Changes in the foreign value of imports may therefore not closely parallel changes in the quantities imported. An increase in the quantity of some imports, as the result of lowering the duty by 50 percent, might be accompanied by some rise in the foreign prices, so that the value of imports would increase by a greater percentage than the quantity. On the other hand, a reduction of 50 percent in some duties, particularly specific duties, would tend to permit the entry of goods of lower price range than before; consequently, the average foreign unit value of all the imports might decline, so that the total value of the imports would increase less than the total quantity. Similar considerations apply to increases in the rate of duty.

On a number of commodities the rates of duty in 1939 were subject to tariff quotas; that is to say, duties had been reduced by trade agreements on specified quantities of a given commodity, imports in excess of the quota being subject to the full rate of duty. In forecasting post-war imports under the different assumptions regarding rates of duty, the Commission has assumed that these tariff-quota arrangements will continue in effect, with the quotas of the same size as in 1939. For example, it is assumed that if duties should be reduced by 50 percent, the reduction would apply to the rates on imports within the quota limits, and also to the rates on imports in excess of the quota, but that the size of the quota would remain unchanged. A similar assumption is made with respect to an increase in the rates of duty.

Production for the domestic market.

The quantity and value of the production of a given commodity for the domestic market (that is, production exclusive of exports) will, of course, depend on the magnitude of consumption and of imports. If imports are small, production for the domestic market will be little less than the consumption. If, however, as a result of reduction of the duty, imports should become a much larger part of consumption than before, the absolute quantity produced for the domestic market will be less than at the higher rate of duty unless there is a marked increase in total consumption.

Future production for the domestic market is difficult to estimate: any error either in the estimate of consumption or in that of imports will be reflected in the estimate for production. Of course, these errors may tend to offset one another. For example, an overestimate of consumption may be largely offset by an overestimate of imports, so that the estimate of production may be nearly accurate. On the other hand, the errors may be cumulative. For example, an overestimate of consumption may be accompanied by an underestimate of imports, resulting in a marked overestimate of production for the domestic market.

The difficulty of forecasting prices, under different assumptions regarding national income and regarding rates of duty, adds to the difficulty of estimating the value of production for the domestic market. Moreover, for some commodities there are no pre-war statistics of the value of production but only statistics of quantities, and the estimates of pre-war values which the Commission has made for these commodities are subject to a considerable margin of error, which correspondingly affects the post-war estimates of value of production.

Exports.

This report does not present data which can be used to estimate the total value of exports from the United States in the post-war period. It covers only commodities of which there were in the pre-war period, or are likely to be hereafter, imports of a value exceeding \$100,000. There are many commodities of which the imports are small, or even nil, but of which the exports are large. Hence the estimates made in accordance with the terms of this resolution show only in part the effects upon our export trade, and hence upon domestic production and employment, which would flow from the various assumptions made as to foreign tariffs and trade barriers, and as to incomes in foreign countries. Moreover, no attempt is made to deal in any definitive way with the effects of possible increases or decreases in United States imports, arising from changes in our tariff rates, in increasing or decreasing foreign buying power for United States exports, and hence the levels of production and employment in our export industries. Obviously, too, an increase in United States imports resulting from a marked rise in national income would, by raising foreign buying power, have a major influence on our export trade.

Although thus the present report presents no very significant picture of probable post-war export trade, nevertheless many of the commodities most important in United States export trade are of sufficient importance in the import trade to be covered by these reports, and estimates regarding the post-war exports of these are presented wherever possible.

In estimating exports, factors often have to be taken into account which are not involved in estimating domestic consumption, imports, or production for the domestic market. Estimates of exports must, therefore, be considered subject to an even wider margin of error than the other estimated data.

Certain assumptions must necessarily be made in estimating exports. In the first place, it must be assumed that, if post-war per capita income in the United States will be about the same as before the war, it will also be about the same in foreign countries, in other words, that foreign buying power will be about as great as before the

war. It must also be assumed that no great change will take place in the relation between productive capacity and costs in the United States and in foreign countries. Of course, there are some conspicuous cases in which this assumption is unlikely to hold true, and in which other assumptions on this point must be made. For example, certain countries, notably in Latin America, have erected plants during the war to produce various commodities formerly supplied almost entirely by imports; developments of this sort will tend, of course, to reduce exports of those particular commodities from this and other countries in the post-war period.

In estimating post-war exports it is assumed that an increase of 75 percent in national income in the United States will be accompanied by a more or less corresponding increase in the income of the rest of the world. If consumption of a given commodity in this country is estimated to increase greatly with high national income, it is assumed, in general, that, by reason of greater buying power in foreign countries, the demand for exports of the commodity will also be much larger than with no change in national income. Certain special exceptions must, of course, be made to this assumption.

Finally, in estimating exports it is assumed that a reduction of 50 percent in rates of duty on dutiable goods in the United States will be accompanied by more or less equal reductions on the part of foreign countries, not only in duties but also in other forms of trade barriers, which often restricted trade in the pre-war period even more than duties. In other words, it is generally assumed that a reduction in United States duties would be accompanied by greater opportunities for the export of goods. Conversely, it is assumed that an increase of 50 percent in United States duties would be accompanied by increases in the trade barriers of foreign countries which would tend to lessen our exports.

Total production for domestic market and for export.

If exports of a commodity have been small and are likely to continue to be small, total production in the United States will, of course, be substantially the same as the production for the domestic market. If, however, exports have been and are likely to continue to be important, an estimate of the total quantity and value of production in the post-war period involves a combination of the uncertainties with respect to production for the domestic market and the uncertainties with respect to exports.

Employment.

Employment in the production of a given commodity in the United States is, of course, related to the volume of production of that commodity, both for domestic consumption and for export. Whatever margin of error is involved in the estimation of the total quantity of production necessarily attaches also to estimates of employment. Generally speaking, any cause which favorably or unfavorably affects domestic production, whether for the domestic market or for export, will tend to affect employment in the industry in the same way. However, in estimates of future employment, it is necessary to take account of possible changes in the productive capacity of labor. Introduction of new labor-saving devices might reduce the number of workers even in the face of an increase in output. More-

over, the operation of plants to their full capacity, under the assumption of strong demand resulting from high national income, is likely to reduce the number of man-hours required for a given quantity of output. On the other hand, in some industries, for special reasons, output per man-hour may be lower in the post-war than in the pre-war period. Finally, changes in the number of workers on the pay rolls may not parallel changes in the number of man-hours of work performed; prevailing hours of labor per week may be greater or less after the war than before the war.

There are many commodities for which no statistics of pre-war employment are available, and for some of these even rough estimates of employment at that time can hardly be ventured.

Under the terms of Senate Resolution 341, estimates regarding employment are necessarily confined to the *particular industries* which qualify under the resolution, and to the *number* of workers in these industries. Thus, no account is taken of the effects on employment in other industries (including various export industries) which would result from larger or smaller imports of the various products covered by the resolution, as those imports are affected by the several assumptions regarding national income and rates of duty. Similarly, no consideration is given to the relative productiveness of labor in different fields.

Interrelation of Commodities

In making estimates of post-war consumption, production, imports, exports, and employment under the different assumptions regarding national income and rates of duty, account must be taken of the interrelationships among commodities, especially among those which represent different stages of production—raw materials, semimanufactures, and finished manufactures; among those which are related as joint products, or as primary products and byproducts, from a given material; and among those which are capable of substitution for one another.

This point is particularly important in considering the effects of a reduction or an increase of 50 percent in duties. For example, a given raw material may be free of duty, but its consumption, production, and importation may be greatly affected by a change in the duties on semimanufactured or finished products derived from it, and estimates must be made in the light of the estimates for these dutiable articles. So, too, changes in the duty on a given dutiable article may have as much influence on production and imports of related dutiable articles as changes in the duties on these latter articles themselves or possibly more. A conspicuous illustration of this second point is afforded by the wool group—raw wool, wool tops and noils, wool yarns, and fabrics. So, too, a 50-percent reduction in the relatively high duty on wool, although accompanied by a reduction in the relatively low duty on rayon staple fiber, might have a major effect on the ratio of staple fiber to wool in consumption, production, and imports. Another illustration is that of bauxite and aluminum (aluminum production in the United States is mainly from foreign bauxite); imports of bauxite might readily be affected much more by changes in the duty on aluminum than by changes in the duty on bauxite itself, and in the opposite direction.

It is, of course, assumed, in all estimates regarding interrelated dutiable articles, that the duty status of the several articles in the post-war period will be parallel—that the duties on all will either be the same as in 1939, or 50 percent lower, or 50 percent higher, than in 1939.

Position of Philippine Trade

A number of commodities—chiefly sugar, leaf tobacco, cigars, copra, coconut oil, desiccated coconut, canned pineapple, embroidered cotton articles, and cordage—were imported from the Philippine Islands in substantial quantities before the war. At that time nearly all commodities which were dutiable from other countries were free of duty when imported from the Philippines,¹ although imports of sugar and cordage from the Philippines were subject to quantitative limitations.

The Philippine Independence Act provides that, when the islands become independent, all imports from them shall become subject to the "general" rates of duty which apply to other foreign countries (except Cuba, which enjoys a preference of 20 percent or more, compared with the general rates). If this arrangement goes into effect, the imports of major commodities from the Philippines in the post-war period may be much smaller than they would be if the duty-free status were continued. Discussions are, however, under way which might result in a different post-war tariff situation. This is one of the important questions on which recommendations as to policy will presumably be made by the Filipino Rehabilitation Commission, established by the Congress on June 29, 1944. Conceivably, the application of full duties to Philippine goods might be postponed for some years after 1946, or there might be a gradual transition to the full duty status. In the sections of this report which deal with commodities of which the Philippines were major suppliers before the war, estimates of imports and of domestic production are, however, based on the assumption that full duties will apply to Philippine goods.

Government Actions, Other Than Rates of Duty, Affecting Production, Prices, and Imports

In 1939 the production, prices, imports, and exports of various commodities were affected by Federal laws and regulations other than rates of duty. For example, after September 20, 1939, total imports of short-staple cotton and long-staple cotton, respectively, were limited to specified quotas. Again, total supplies of sugar allowed to enter consumption in the United States were limited, and quotas of this total were allocated to producers in continental United States, producers in Hawaii and Puerto Rico, respectively, and to imports from the Philippines, from Cuba, and from other foreign countries, respectively. Moreover, the production and the prices of a number of other farm products in the United States were affected by various provisions of law and of Government regulations.

It is obviously impossible to forecast what laws and regulations of this sort may be in effect in the post-war period. Pre-war measures may be continued, or modified, or withdrawn altogether; or entirely new measures may be introduced. In the sections dealing with some of the commodities, assumptions, or alternative assumptions, are made with respect to these matters and their probable effect upon consumption, production, imports, and exports.

¹ The only exception was that of the processing tax on coconut oil, which was 3 cents per pound on oil of Philippine origin and 5 cents per pound on oil of other foreign origin.

Margin of Error in Estimates

As already pointed out, estimates herein presented regarding the quantity and value of imports, production, consumption, and exports, and the number of persons employed in the post-war period, are subject to a very considerable margin of error. In the first place, all the estimates are based on more or less arbitrary general assumptions regarding exchange, prices, and conditions in foreign countries, and like matters which may prove unfounded in whole or in part. Even if all these general assumptions should prove to be substantially correct, there remains a wide margin of error. For some commodities it may be hardly more than 5 or 10 percent in either direction, but for others the estimates may be as much as 50 to 100 percent too high, or as much as 33½ to 50 percent too low. The figures presented, however, represent the most probable levels of imports, production, consumption, exports, and employment under the different assumptions specified in the Senate resolution.

A single estimated figure is generally presented with reference to each aspect, under each assumption, for a given commodity. This method of presentation makes it easier for the reader to note the relation of one estimate to another. Estimates for a good many commodities, however, are expressed in ranges. The ranges are kept as narrow as practicable, but some are necessarily wide because of marked uncertainties. It is recognized also that the lowest figure given for a range in many estimates may well prove to be too high, and that the highest figure may prove in fact to be too low.

SUMMARIES BY TARIFF SCHEDULES

In accordance with the instructions of the Senate Resolution, the Commission is presenting the sections on individual commodities, or groups of commodities, by tariff schedules, except that articles on the free list have been distributed among the first 15 schedules which cover related dutiable articles.

Combined totals for the commodities in a given schedule can be presented only for values, or the number of persons employed; quantities expressed in diverse units cannot, of course, be added. For each schedule (and the related free-list items) combined totals of the estimated value of imports and production for the domestic market in the long-term post-war period (not for the short term), under the several assumptions regarding national income and rates of duty, are presented. Those estimates are compared with the corresponding figures for 1939. The estimates of post-war exports and employment are so incomplete that no combined totals are given on those subjects for any of the schedules.

It should be recognized that there is an appreciable margin of error in these combined totals for estimates of imports and production. Of course, the errors in the estimates for individual articles may be in both directions, and may thus offset one another to a considerable extent. This offsetting is the less likely to result in trustworthy totals if the number of articles is small, and especially if some one or two articles dominate in the totals.

GENERAL SUMMARY OF PRODUCTION (FOR THE DOMESTIC MARKET) AND IMPORTS

DUTIABLE AND FREE COMMODITIES

Table 1 summarizes United States production (for the domestic market) and imports of all commodities, whether dutiable or free, which are covered by this report, for 1939, and the corresponding estimates for the post-war period under the several assumptions as to national income and rates of duty. In presenting this general summary, it is necessary to call attention to a basic reservation regarding the margin of error involved. In the nature of the case, such a general summary must omit the numerous qualifications and explanations made both in the preceding introduction and in the sections on the individual commodities throughout the main body of the report. In the aggregate, these qualifications are of such importance that the selection and use of particular figures from the summary, without the appropriate accompanying explanations, involves a definite hazard.

It is true that in totals such as those presented in table 1 the margin of error, within the given assumptions on which the estimates are based, will probably be less than the margin of error for many of the individual items, because of the tendency of individual errors to offset one another. But, as pointed out in the introduction, it has been necessary for the Commission to set up a wide variety of assumptions (apart from those set forth in S. Res. 341 itself) as a basis for its estimates. Many of these assumptions may not in fact be realized, and errors arising from that cause may be cumulative and important.

Because of the many uncertainties involved, estimates of the consumption, production for the domestic market, and imports for many individual commodities were expressed in the form of a range, sometimes a rather wide range. In totaling these estimated values, it has been necessary to take the middle point of the range in each case. The combined totals thus have an apparent precision which does not conform to the opinion of the Commission on the margin of error in its estimates.

Table 1 does not include 1939 data, or post-war estimates, of total production, including production for export, even of the commodities covered by the report; still less does it cover production for export of the many commodities which are important in the export trade but not in the import trade, estimates for which are not called for by Senate Resolution 341. Peculiar difficulties were involved in making estimates of exports even for the commodities actually included in the report. Changes in national income and in rates of duty would, of course, affect not only imports but also exports.

TABLE 1.—Summary of United States production (for domestic market) and imports of all commodities covered by this report, for 1939, and estimates for the post-war period ¹

Item	1939	Estimates for post-war long term					
		Per capita income as in 1939			Per capita income 75 percent above 1939		
		Duties as in 1939	Duties reduced by 50 percent	Duties increased by 50 percent	Duties as in 1939	Duties reduced by 50 percent	Duties increased by 50 percent
Production for the domestic market (million dollars): ²							
a. Gross.....	41,218	49,647	48,787	50,063	76,080	74,901	76,720
b. Net (estimated as 75 percent of gross).....	30,914	37,235	36,590	37,547	57,060	56,176	57,547
Imports:							
c. Foreign value (million dollars).....	2,052	2,182	2,645	1,948	3,622	4,389	3,220
Estimated ratio of landed value to foreign value (percent).....	126.4	126.4	119.2	133.6	126.4	119.2	133.6
d. Landed value, estimated (million dollars).....	2,594	2,788	3,153	2,603	4,578	5,232	4,302
Ratio of imports to production for domestic market (percent):							
Based on a and c.....	5.0	4.4	5.4	3.9	4.8	5.9	4.2
Based on b and c.....	6.6	5.9	7.2	5.2	6.3	7.8	5.6
Based on b and d.....	8.4	7.4	8.6	6.9	8.0	9.3	7.5
Ratio to 1939 (percent):							
Production for domestic market.....	100	120	118	121	185	182	186
Imports (foreign value).....	100	106	129	95	177	214	157
Ratio to estimates at lower income level (percent):							
Production for domestic market.....		100	100	100	153	154	153
Imports (foreign value).....		100	100	100	166	166	165
Ratio to estimates at unchanged duty level (percent):							
Production for domestic market.....		100	98	101	100	98	101
Imports (foreign value).....		100	121	89	100	121	89

¹ In totaling the estimated values, the Commission has taken the middle point of those estimates which, because of the many uncertainties involved, were expressed in the form of a range.

² Does not include production for export; see text.

Scope of Statistics

This report covers 454 commodities or groups of closely related commodities. These include (with the exceptions stated below) all statistical classifications distinguished by the Department of Commerce of which the value of imports in 1939 exceeded \$100,000, together with a few items of which the imports in the post-war period may, in the opinion of the Commission, exceed \$100,000. The omission of items of which imports exceeded \$100,000 mostly fall into five groups: (1) "Basket" items, some dutiable and some free; (2) so-called noncommercial items, principally United States goods returned and household and personal effects; (3) duty-free works of art for which even the pre-war value of domestic production could not be estimated; (4) the large imports of certain minerals (principally copper but also petroleum, lead, and zinc) for treatment in bond and export of the resulting products, and also imports of petroleum products for supplies of vessels; (5) crude petroleum, the production and imports of which in the post-war period can not be forecast; and (6) imports of raw sugar for refining and export.

The aggregate value of the imports in 1939 of the classifications covered by this report was 2,052 million dollars. The total value of imports in that year was 2,276 million, so that this report covers 90.2 percent of the import trade of that year.

Of the total value of the imports covered by the report, 994 million dollars, or 48.4 percent, represented articles or groups of articles here classed as dutiable, and 1,058 million, or 51.6 percent, articles classed as free. In general, dutiable articles are entirely separated from free articles in the report. For a number of articles (including several imports of large magnitude), however, the nature of the statistics made it necessary to combine the two classes; the resulting item as a whole was then treated in this summary as free or dutiable according to which class dominated the imports in 1939.

The ratio for free articles of 51.6 percent in table 1, is much lower than that in the total imports of 1939, which was 61.4 percent. One reason for this disparity is that most of the imports of the five groups of articles omitted from the report are free of duty. Another reason is that imports of Philippine products, which had preferential duty-free entry in 1939, though dutiable when imported from other countries, are here included with the duty-paying imports of the same commodities, the post-war estimates of imports being based on the assumption that Philippine products will then be subject to the full rates of duty.

It should be emphasized that in table 1 (and also in tables 2 and 3) the 1939 data and the post-war estimates for domestic production relate only to production for the domestic market and do not include production for export. The Commission found it impossible to forecast post-war exports of many commodities.

Assuming that changes in national income as well as changes in duties in the United States would be accompanied by parallel changes in foreign countries, production for export would, of course, be much affected by such changes. For example, if duties throughout the world should be reduced by 50 percent, the increase in United States exports, which for decades have exceeded imports, might readily more than offset any reduction in production for the domestic market resulting from the lowering of our own duties. A converse statement holds as to the effect of an increase in duties throughout the world.

Margin of Error in the Totals

As has been stated in the introduction, there is a considerable, frequently a wide, margin of error in the estimates of post-war consumption, production for the domestic market, and imports of individual articles, and this margin of error would remain even if all the rather arbitrary assumptions upon which the estimates are made should be realized. In the totals given in table 1, these errors tend to offset one another, but an appreciable margin of error still persists in the totals themselves.

This margin of error is probably greater in the estimates made on the assumptions (at both the lower- and the higher-income levels) of a 50-percent reduction or 50-percent increase in duties than in the estimates made on the assumption of no change in duties. Moreover in the estimates as to the effect of change in duties it is greater for production than for imports; the effect of a change in duty on the quantity of a commodity imported is less difficult to forecast than its effect on production for the domestic market.

According to the estimates in table 1, the value of consumption (namely, the sum of the net value of production for the domestic

market and the landed value of imports), for all commodities combined, would be less (at both income levels) with duties reduced than with unchanged duties, whereas the value of consumption would be greater with increased than with unchanged duties.¹ In other words, if duties should be reduced, the decrease in the net value of domestic production (for domestic market) would, at least apparently, somewhat exceed the increase in the value of imports, whether foreign value or landed value. The converse situation appears on the assumption of an increase in duties.

This circumstance is due to two causes, which may best be understood by reference to the estimates based on the assumption of a reduction in duties (converse statements apply to the effects of an increase in duties):

(1) The quantity of many commodities which will be consumed at a reduced rate of duty has apparently been underestimated. Frequently the possible increase in consumption with a reduction in duty, if relatively small in terms of percentage, was not expressly taken into account, it being stated that consumption (at the given income level) would be about a specified quantity, or somewhat larger or somewhat smaller if the duty should be reduced or increased and no definite figure for consumption under these conditions was set forth. This was done because of the difficulty of estimating the effect of the duty change on consumption, though where the effect might be expected to be fairly large it was, of course, necessary to make such an estimate, however lacking in precision.

It has been assumed that, even at the higher income level, domestic production of most commodities would be able to supply the entire demand in excess of estimated imports; in other words, production for the domestic market was computed by subtracting estimated imports from estimated consumption. Under these circumstances, any error in the estimate of consumption was carried over into the estimate of production (for the domestic market). In the case of commodities where the domestic producing capacity may (especially at the higher income level) be limited by depletion of natural resources or other causes, production was estimated independently.

(2) The data given in table 1 are values. A reduction in duty, although ordinarily resulting in some quantitative increase in consumption, is also likely to result in some reduction in the price of the domestic product as well as in the landed price of imports. A reduction in price may offset, or more than offset, the increase in the quantities consumed, causing an actual decrease in the value of consumption; or it may only partly offset the quantitative increase. It should be noted further that estimates of prices, both of the domestic and of the imported product, resulting from changed rates of duty involved much difficulty and are subject to a considerable margin of error.

¹ It should be noted that the magnitude of these disparities is affected by the percentage adopted by the Commission for estimating the ratio of the net value (exclusive of duplication) to the gross value of production for the domestic market. If, for example, that ratio had been estimated at 70 percent instead of 75 percent, the excess of the estimated value of consumption at unchanged duties over the estimated value based on a 50-percent reduction in duties would be smaller, in absolute amount, than shown in table 1, though the ratio of the two estimates to one another would, of course, be unchanged. The converse would, of course, be true if the ratio had been estimated at 80 percent instead of 75 percent. See the following section.

Duplication in Production Statistics

It is of the utmost importance in summarizing the pre-war statistics and the post-war estimates of production for the domestic market to bear in mind that the production data include a large measure of duplication, resulting from the use of raw or semimanufactured commodities as materials for manufacture. According to estimates of the Department of Commerce, the gross value of products of agricultural, mineral, and manufacturing industries (including freight receipts of railroads), excluding production for export, in 1939, was 69.5 billion dollars. The net value of production (for the domestic market), exclusive of duplication, was calculated at 37.3 billion dollars, or 54 percent of the gross total. The extent of duplication in the combined totals of value of domestic production for the commodities covered by this report is, however, much less than that in the Department of Commerce figures.

An illustration of the difference between the two sets of figures in this respect may be drawn from the treatment of cattle and beef. In the gross totals compiled by the Department of Commerce, the total value of cattle produced on farms is included and also the value of beef derived from the cattle. In the present report cattle and beef are treated as one item, with little or no duplication. Among other major crude agricultural commodities the value of which is duplicated, in whole or in part, in the gross value of products given by the Department of Commerce but not (or only to a small extent) in the present report may be mentioned milk, sheep, hogs, poultry, sugar beets, sugarcane, and certain kinds of fruits and vegetables. There is also, in the Department of Commerce totals, extensive duplication between crude mineral products and semimanufactured products derived from them; in general, such duplication has been avoided in this report.

It is probable that, as the result of the methods employed in the present compilation, the ratio of net value to gross value of production (for the domestic market) is somewhere between 70 and 80 percent. In table 1 the round ratio of 75 percent is used in computing net value both for 1939 and for the post-war estimates.

The ratio of net to gross value adopted for this purpose affects the relation of many of the figures in the table to one another. If, for example, the true ratio of net to gross value were 70 percent rather than 75 percent, the figures for value of production for the domestic market, throughout the table, would be about 7 percent smaller than those shown. As a consequence the several ratios of value of imports to net value of production would be somewhat higher than those given. Moreover, the differences in estimated net value of production for the domestic market, as between the assumption of unchanged duties and the assumptions of a decrease or an increase in the duties, would be appreciably smaller in absolute amount than those appearing in table 1, although showing, of course, the same percentages of change. Finally, the increase in net value of production for the domestic market at the higher income level over that at the lower income level would be smaller in absolute amount, although by the same percentage. Converse statements would obviously hold if the true ratio of net to gross value of production for the domestic market were 80 percent rather than 75 percent.

The estimated net value in 1939 of production (for the domestic market) of the articles covered by this report was 30.9 billion dollars. The Department of Commerce estimate of net value for all commodities in that year was 37.4 billion, or 20 percent greater. A large part, and perhaps all, of this difference is due to the fact that the present report is less comprehensive in scope than the Department of Commerce figures; it covers practically no commodities of which the imports in 1939 were less than \$100,000 (and of course none of which imports were nil), and among such commodities a good many are of great importance in domestic production.²

Basis of Import Statistics and Estimates

The import statistics of the United States are based upon foreign value.³ It is estimated by the Commission, on the basis of data furnished by the Department of Commerce and the Maritime Commission, that in the pre-war years 1937-39 the average freight charge on all imports was about 12 percent of the foreign value. Adding to this charge the average rate of duty in 1939, which was 14.4 percent (calculated on total dutiable and free imports), gives an excess of landed value over foreign value of 26.4 percent. This ratio may be taken as fairly representative for the dutiable and free articles covered by the present report, taken as a group.

For the purpose of post-war estimates of landed value it is assumed that freight charges will on the average bear the same ratio to foreign value of imports as before the war. It is also assumed that if all rates of duty are reduced 50 percent, the average rate on free and dutiable imports would be reduced by 50 percent, i. e., from 14.4 percent in 1939 to 7.2 percent, and that an increase of 50 percent in the duties would similarly raise the average to 21.6 percent.⁴

Estimated Increase of Post-War Over Pre-War Production and Imports

With no change in per capita national income or in duties.

Population in the long-term period is expected to be about 10 percent greater than in 1939. Assuming that the general price level will be substantially as in that year, and assuming no change in duties, one might perhaps expect that, in the aggregate, the value of the production (for the domestic market) of the commodities covered by this report, and also the value of imports, would be about 10 percent greater than in 1939. The post-war estimates for imports based on these assumptions, however, exceed the 1939 figures by only 6 percent, whereas the estimates of production for the domestic market show an excess of 20 percent over 1939. This relatively high percentage of increase for production does not necessarily indicate that overestimates, which no doubt have been made for many commodities, are not offset by underestimates for other items, although it may perhaps point toward that conclusion.

Examination of the estimates of the value of post-war production by tariff schedules shows that a very large part of the total increase

² Petroleum is also omitted, not because the imports were less than \$100,000 in 1939 but because of the impossibility of making forecasts regarding either production or imports.

³ There are a few exceptions where the basis is the American selling price of similar domestic products, but the value of the trade reported on this basis is a very small part of the total.

⁴ As a matter of fact, a 50-percent reduction in duties would presumably increase somewhat the proportion of imports consisting of dutiable articles, so that the average rate on dutiable and free articles combined might become somewhat higher than 7.2 percent; conversely, with an increase in the duties the average rate might become somewhat less than 21.6 percent.

above 1939 (on the above assumptions regarding income and duties) is attributable to seven of the schedules, namely, chemicals, metals, agricultural products, rayon, cotton, paper, and sundries. The relatively large increase in production for items on the sundries schedule is principally due to the fact that this schedule includes the war-created synthetic-rubber industry.

The item of rubber is also of importance with regard to the estimates of total imports in the post-war long-term period. If a large fraction of the synthetic-rubber industry continues in operation during that period, imports of rubber, unless national income increases sharply, are likely to be materially smaller than before the war. Deducting rubber from the figures both for 1939 and for the post-war period, the increase estimated for imports (on the assumptions that per capita national income and duties are as in 1939) is 11 percent, compared with 6 percent when rubber is included.

With per capita national income 75 percent higher than in 1939 and no change in duties.

With so great an increase in national income, production and imports of most commodities would be greater in quantity, often much greater, than at the lower level of income. The Commission assumes also that prices would be considerably higher at the high income level (on the average about 13 percent higher). As shown in table 1, the estimates for production (for the domestic market) in the post-war period at the high income level exceed the 1939 figure by 85 percent; the estimated increase for imports is 77 percent (both on the assumption that duties remain as in 1939). Production (for the domestic market) is estimated as 53 percent greater in value under the higher than under the lower income level, and imports as 66 percent greater. In terms of absolute amounts, net production (for the domestic market) is estimated as 26.4 billion dollars greater at the higher than at the lower income level (on the assumption of unchanged duties), and imports (foreign value) as 1.44 billion dollars greater. The effect of high income in increasing imports would thus be much greater than the effect of a reduction in duties. This effect, of course, would be expected, since high income would increase the imports of duty-free as well as dutiable articles, and in 1939 articles classed as duty-free in this report accounted for over half of total imports.

Ratio of Imports to Domestic Production at Unchanged Duties

The foreign value of imports in 1939 was equal to 6.6 percent of the estimated net value of production for the domestic market (eliminating duplication); the corresponding ratio based on estimated landed value of imports was 8.4 percent. Assuming unchanged per capita income and unchanged rates of duty, these ratios are estimated for the post-war long-term period at somewhat lower figures, 5.9 and 7.4 percent, respectively.⁵ An appreciable part of this decrease in ratio is due to the anticipated effects of the creation of the domestic synthetic rubber industry. The disparity between the estimated increase in production under these assumptions and the estimated increase in imports has already been discussed.

⁵ As to the accuracy of the post-war estimate of production on which this ratio is based, see the preceding section.

The ratio of imports to domestic production, according to the estimates in this report, is likely (if duties remain as in 1939) to be somewhat greater at the higher than at the lower income level. This is due chiefly to two factors: (1) the fact that a good many imported articles are more of a luxury character than the corresponding domestic articles; and (2) the possibility that domestic mines and forests may not increase their output of certain products commensurately with the increase in demand which would result from high national income.

Effects of Duty Changes on Value of Imports

The ratio both of foreign value and of landed value of imports to the value of domestic production would be materially affected by a 50-percent change in rates of duty. A reduction of duty would, of course, affect the foreign value of imports more than the landed value, since in the landed value the increase in quantity would be partly offset by a lower duty-paid price. From the standpoint of international commercial relations, the estimates of the foreign value of imports under the several assumptions regarding rates of duty are particularly significant. According to table 1, on the assumption of per capita national income the same as in 1939, a 50-percent reduction in duties would result in post-war imports greater by 463 million dollars, or by 21 percent, than would enter with duties as in 1939. At the higher income level this difference in imports under the two assumptions regarding duties becomes 767 million dollars, or 21 percent.

Conversely, a 50-percent increase in duties would, according to these estimates, reduce the foreign value of imports by 234 million dollars, or 11 percent, at the lower income level, and reduce it by 402 million dollars, or 11 percent, at the higher income level.

DUTIABLE COMMODITIES

Table 2 summarizes for dutiable commodities (or composite items partly dutiable and partly free) the data regarding production (for the domestic market) and imports. By reason of the combination of certain articles into groups comprising both free and dutiable articles, the distinction between dutiable articles in table 2 and free articles in table 3 is not a sharp one. Moreover, in this process of grouping into composite items, the amount of trade that is actually free but which has been assigned to the dutiable category is much larger than the amount of trade that is actually dutiable which has been assigned to the free category. This circumstance in part explains the excess of the total foreign value of imports in 1939 of items classed as dutiable in this report, namely 994 million dollars, over the total dutiable imports in 1939 reported by the Department of Commerce, 879 million dollars. An equally important explanation of this disparity however, lies in the fact, already mentioned, that the imports which in 1939 entered free of duty from the Philippines by reason of preference are, in the present compilation, counted as dutiable.

On presenting the data for dutiable commodities, adjustments in the statistics both of production (for the domestic market) and landed value of imports are made on the same bases as were used in table 1 for dutiable and free commodities combined. It is assumed that the average rate of duty on all dutiable imports in 1939, which was 37.3 percent ad valorem, can be used as a basis for computing landed

value for the articles and groups classified as dutiable in this report, and that 50-percent changes in duties would result in average rates in the post-war period of 18.7 and 56.0 percent, respectively.⁶

TABLE 2.—Summary of United States production (for domestic market) and imports of dutiable commodities covered by this report, for 1939, and estimates for the post-war period¹

Item	1939	Estimates for post-war long term					
		Per capita income as in 1939			Per capita income 75 percent above 1939		
		Duties as in 1939	Duties reduced by 50 percent	Duties increased by 50 percent	Duties as in 1939	Duties reduced by 50 percent	Duties increased by 50 percent
Production for the domestic market (million dollars): ²							
a. Gross	87,348	45,075	44,216	45,491	66,221	65,043	66,868
b. Net (estimated at 75 percent of gross)	28,011	33,806	33,162	34,118	51,916	51,032	52,401
Imports:							
c. Foreign value (million dollars)	994	1,137	1,603	903	2,040	2,809	1,626
Estimated ratio of landed value to foreign value (percent)	149.3	149.3	130.7	168.0	146.3	130.7	168.0
d. Landed value, estimated (million dollars)	1,484	1,697	2,095	1,517	3,046	3,671	2,732
Ratio of imports to production for domestic market (percent):							
Based on a and c	2.7	2.5	3.6	2.0	2.9	4.1	2.3
Based on b and c	3.5	3.4	4.8	2.6	3.9	5.5	3.1
Based on b and d	5.3	5.0	6.3	4.4	5.9	7.2	5.2
Ratio to 1939 (percent):							
Production for domestic market	100	121	118	122	185	182	187
Imports (foreign value)	100	114	161	91	205	283	164
Ratio to estimates at lower income level (percent):							
Production for domestic market		100	100	100	154	154	154
Imports (foreign value)		100	100	100	179	175	180
Ratio to estimates at unchanged duty level (percent):							
Production for domestic market		100	98	101	100	98	101
Imports (foreign value)		100	141	79	100	138	80

¹ In totaling the estimated values, the Commission has taken the middle point of those estimates which, because of the many uncertainties involved, were expressed in the form of a range.

² Does not include production for export; see text.

In 1939 the ratio of the foreign value of imports of all dutiable commodities covered by this report (including some items consisting partly of free articles) to the estimated net value of domestic production was 3.5 percent, and the ratio based on landed value of imports 5.3 percent. These percentages are considerably lower than those based on all commodities, free and dutiable, for the reason that domestic production of many duty-free articles is small or even nil.

The ratio of the estimated post-war production (assuming no change in national income or in duties) to actual production in 1939, is the same for dutiable commodities as for all commodities, free and dutiable, 120 percent.⁷ A considerable difference, however, appears between the two sets of ratios for imports (114 percent of the 1939 figure in table 2 as against 106 percent in table 1). This difference is largely explained by the fact that rubber, which is duty-free, appears in table 1 but not in table 2.

⁶ See footnote 4.

⁷ The possible exaggeration involved in this ratio has been discussed in the foregoing section.

For dutiable commodities, the estimated effect of a high-income level on production and imports in the post-war period also naturally resembles the effect on all commodities, free and dutiable. However, the estimated percentage of increase in imports of dutiable commodities (foreign value) under this income assumption is considerably higher than that for all commodities.

The estimated effects of 50-percent changes in the rates of duty upon production (for the domestic market) and imports are, of course, greater, in terms of percentages, for dutiable commodities alone than for all commodities, including those free of duty.

DUTY-FREE COMMODITIES

Table 3 summarizes for duty-free commodities (or composite items principally free but partly dutiable) statistics for 1939 and post-war estimates of production (for the domestic market) and imports. As already stated, in the process of grouping articles into composite items relatively little trade that is actually dutiable has been assigned to the free category.

TABLE 3.—*Summary of United States production (for domestic market) and imports of duty-free commodities covered by this report for 1939 and estimates for the post-war period*¹

Item	1939	Estimates for post-war long term	
		Per capita income as in 1939	Per capita income 75 percent above 1939
Production for the domestic market (million dollars): ²			
a. Gross.....	3,870	4,572	6,859
b. Net (estimated at 75 percent of gross).....	2,902	3,429	5,144
Imports:			
c. Foreign value (million dollars).....	1,058	1,044	1,586
Estimated ratio of landed value to foreign value (percent).....	112	112	112
d. Landed value, estimated (million dollars).....	1,185	1,169	1,776
Ratio of imports to production for domestic market (percent):			
Based on a and c.....	27.3	22.8	23.1
Based on b and c.....	36.5	30.4	30.8
Based on b and d.....	40.8	34.1	34.5
Ratio to 1939 (percent):			
Production for domestic market.....	100	118	177
Imports (foreign value).....	100	99	150
Ratio to estimates at lower income level (percent):			
Production for domestic market.....		100	150
Imports (foreign value).....		100	152

¹ In totaling the estimated values, the Commission has taken the middle point of those estimates which, because of the many uncertainties involved, were expressed in the form of a range.

² Does not include production for export; see text.

In presenting the data for free commodities, adjustments in the statistics both of production for the domestic market and of imports are made on the same bases as were used in table 1 for dutiable and free commodities combined, except, of course, that in estimating landed value of imports no addition to foreign value needs to be made on account of duties.³

³ Table 3 gives only a single column for the post-war estimates based on per capita income as in 1939, and a single column for estimates at the higher income assumption. A general reduction or a general increase in duties on articles now dutiable would, however, have an effect upon production and imports of certain duty-free commodities, which enter into the dutiable manufactured articles. This, however, is true only in a limited number of cases and the effect is disregarded in this summary table.

The ratio of imports to domestic production is much higher for duty-free articles as a group than for dutiable articles. In 1939 the landed value of the imports of free articles was equal to nearly 41 percent of the estimated net value of the domestic production of these same articles.

The estimated net value of domestic production of duty-free articles in the post-war period, on the assumption of national income as in 1939, shows an increase materially greater than the probable increase in population, whereas the estimate of total value of duty-free imports shows a slight absolute decrease in the face of a larger population. The explanation lies in considerable part in the estimates of production and imports of the one commodity, rubber, to which attention has already been directed.

The estimates indicate that a high level of national income would have, on the average, less effect in increasing consumption of free than of dutiable commodities; nevertheless, both for domestic production and for imports the increase over the estimates at the lower income level is about 50 percent.

SCHEDULE 1. CHEMICALS, OILS, AND PAINTS, AND RELATED ITEMS PROVIDED FOR IN THE FREE LIST

INTRODUCTION AND SUMMARY

In this section of the report are presented separate comments on each of the items in schedule 1 of the Tariff Act of 1930 which come within the scope of Senate Resolution 341. The only items omitted are vegetable and animal drugs, advanced in value, n. e. s., the imports of which in 1939 were valued at \$512,000, and certain other animal drugs; gums and resins, n. s. p. f.; roots; and flower parts, valued at \$843,000. The nature of the numerous articles included under these classifications is such that no estimate of post-war trade appeared feasible.

In addition to these dutiable imports, the report includes comments on free products, the imports of which in 1939 were valued at 99.7 million dollars, foreign value.

This section covers individual items and groups of items the imports of which in 1939 accounted for well over 90 percent of all the imports of chemicals, oils, and paints dutiable or subject to import excise taxes.

The estimates of production for the domestic market and the estimates of imports under the several assumptions in the resolution have been totaled. Where the estimates are given in ranges, the average of the high and low has been used for purposes of calculation. The information available on exports and employment is not sufficiently complete to warrant tabulation. To facilitate the discussion of these totals, they have been divided into three groups as follows:

- (1) Chemicals, oils, and paints dutiable under schedule 1 or subject to import excise tax (except fats and oils).
- (2) Free chemicals and related products (except fats and oils).
- (3) Fats and oils and oil-bearing materials, partly free and partly dutiable or taxable.

Not included in these totals is one important item, crude petroleum, for which the Commission did not find it possible to make post-war estimates. In domestic production this item is exceeded in value only by gasoline, among articles classified as chemicals.

No comparison is made between the figures of production and imports since there is a considerable amount of duplication in the production figures where the values of raw materials, semifinished, and finished products have been added to arrive at the total. Excluding such duplication, it is estimated that the net value of production (for the domestic market) of the three groups combined would probably be about 90 percent of the gross totals. The relationships of the

post-war estimates to the corresponding figures for 1939 are shown below:

Period, income level, and tariff treatment	Production for the domestic market		Imports	
	Value	Ratio to 1939	Foreign value	Ratio to 1939
<i>Chemicals, oils, and paints, dutiable and taxable (except fats and oils)</i>	<i>Million dollars</i>	<i>Percent</i>	<i>Million dollars</i>	<i>Percent</i>
1939.....	2,803.1	100	48.1	100
Post-war long term:				
Per capita income as in 1939:				
Duty as in 1939.....	4,618.3	165	47.2	98
Duty reduced by 50 percent.....	4,601.3	164	63.5	132
Duty increased by 50 percent.....	4,629.1	165	38.1	79
Per capita income 75 percent higher than in 1939:				
Duty as in 1939.....	5,931.2	212	78.1	162
Duty reduced by 50 percent.....	5,907.4	211	101.0	210
Duty increased by 50 percent.....	5,964.4	212	57.3	119
<i>Chemicals, oils, and paints, free</i>				
1939.....	406.7	100	99.7	100
Post-war long term:				
Per capita income as in 1939.....	491.8	121	94.7	95
Per capita income 75 percent higher than in 1939.....	664.6	171	143.1	149
<i>Fats and oils and oil-bearing materials, partly free and partly dutiable or taxable</i>				
1939.....	921.0	100	85.0	100
Post-war long term:				
Per capita income as in 1939:				
Duty as in 1939.....	1,073.0	116	98.0	115
Duty reduced by 50 percent.....	1,032.0	112	118.0	139
Duty increased by 50 percent.....	1,116.0	121	80.0	94
Per capita income 75 percent higher than in 1939:				
Duty as in 1939.....	1,458.0	158	125.0	147
Duty reduced by 50 percent.....	1,434.0	156	147.0	173
Duty increased by 50 percent.....	1,483.0	161	106.0	125

Most estimates made with respect to individual articles, under the various assumptions in the resolution, are subject to considerable, frequently wide, margins of error. In the estimates for articles included in each of the totals given above, the errors made are probably in both directions and thus may, to a considerable extent, offset one another. Nevertheless, the margin of error in the totals given above, with the exception of those on fats and oils, is doubtless considerable, possibly as much as 10 percent. The margin of error in the totals on fats and oils is probably about 5 percent.

Taking the figures as they stand, however, they indicate the probability that, regardless of changes in rates of duty, production for the domestic market of articles dutiable or subject to import-excite taxes will, in the post-war long term, exceed that of 1939 by more than 60 percent; much more than that caused by the assumed 10-percent increase in population even if per capita national income remains the same as in 1939. If the national income is 75 percent higher, then production will be more than double that of 1939. The margin of error does not appear to be large enough to invalidate these conclusions. The probability of such an increase results from the fact that, even with per capita national income the same as in 1939, demand in the post-war long term for many of the important articles in the schedule—coal-tar products, for instance—will almost certainly reflect an increase greater than that resulting from the increase in population.

Changes in rates of duty will have a considerable effect on the post-war import trade in this group of items. The effect of the increased

income is, however, much greater than that of the duty changes. Without any change in duty it is assumed that, if the income is 75 percent higher, imports will be 60 to 70 percent greater than in 1939.

It has been desirable to group together certain similar commodities, some of which are dutiable and some of which are free. Apart from fats and oils, which are shown separately, the most important of these mixed groups are starches, vegetable tanning materials and extracts, essential oils, sodium sulfate, and salt. For most of these composite items the bulk of the imports in 1939 entered free of duty, and most of them are included with the free items in the table. Vegetable tanning materials and salt, however, are composite items which, though including some duty-free goods, consist chiefly of dutiable goods, and these items are included with the dutiable and taxable items.

The production of items free of duty related to chemicals, oils, and paints and not included in the group referred to above was valued at 407 million dollars in 1939. It is estimated that in the post-war period the production of these products will be 20 to 75 percent above that in 1939 in value—the greatest increase coinciding with the high level of national income. The principal items in production are fertilizers, coal-tar crudes, asphaltum, and sulfur, the production of each of which is expected to show substantial increase in the post-war period. Imports in this group which amounted to 100 million dollars in 1939 will probably not increase as much as the growth of population, unless the national income is substantially above 1939; if income increases substantially, imports are likely to increase by 40 to 50 percent.

In the absence of changes in per capita income and in tariffs, the value of post-war production of fats and oils for domestic consumption, as well as the value of imports, would reflect principally: (1) A slight per capita increase in the over-all quantity consumed; (2) increases in the unit prices of fats and oils averaging about 10 percent; and (3) a larger domestic production of soybean oil than was produced in 1939. Changes in duties, within the limits premised in this report, would probably have only small effect on the aggregate domestic production, principally because the quantity and value of the domestic output of the most important fats and oils (notably butter, lard, and cottonseed oil) would be only moderately affected. The effects of changes of duty on imports, however, would be considerable.

A per capita income 75 percent higher than existed in 1939, accompanied by the level of tariffs in effect in that year, would probably result in a much greater production of byproduct fats and oils, particularly lard and cottonseed oil, than was estimated on the basis of the 1939 income level, but not in a correspondingly higher consumption of all fats and oils used for food. As a consequence, the price of lard and cottonseed oil and the other domestic oils most directly competitive with them might be somewhat lower than was estimated for them on the basis of the 1939 level of income.

Prices of most other fats and oils, however, under the higher income would probably be higher than those estimated under the lower income level, particularly those of butter, olive oil, linseed oil, and tung oil. The value of production of all fats and oils for the domestic market would probably be about one-third higher than that estimated under the 1939 level reflecting principally: (1) A larger per

capita consumption of butter at much higher unit prices, (2) a greater production of soap containing a somewhat higher proportion of domestic fats and oils, (3) very much greater quantities of fats and oils used in paints, varnishes, etc., and in miscellaneous products, and substantially higher prices for a number of the most important oils entering these uses.

Aggregate imports would probably be substantially higher in value, but somewhat lower in quantity, under the higher income level than under the lower, principally because there would be less need for supplementary imports of oils used in food and, to some extent, those used in soap and in miscellaneous products.

Changes in the levels of duties under the higher income would probably have slightly smaller effect on the total value of domestic production, and slightly greater effect on the value of imports, than that estimated under the premise of the 1939 level of income.

STEARIC ACID

Tariff paragraph: 1.

Commodity: Stearic acid.

Rate of duty: 15% or 25% plus import-excise tax on taxable oils from which derived. *Equivalent ad valorem (1939):* 46-64% (weighted average, 50%).

NOTE.—The rate fixed in the Tariff Act of 1930 was 25 percent ad valorem, regardless of value, which was reduced to 15 percent on stearic acid valued at more than 8 cents per pound, effective January 1, 1933, pursuant to the trade agreement with the United Kingdom. In addition to the tariff duty, the Revenue Act of 1935 imposed an import-excise tax on the part of a commodity (by weight) consisting of or derived from a product taxed under the Revenue Act of 1934 or 1935. This tax varies with the type of oil. For stearic acid proportionate amounts are charged, depending on the quantities of the different taxable oils used. To give definite figures would necessitate listing all types of stearic acid.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	33,674	1,252	32,422	1,278	33,700	Percent 4
Value (\$1,000).....	3,550	150	3,400	107		
Unit value (per pound).....	\$0.105	\$0.120	\$0.105	\$0.084		
Persons employed (number).....	1,000					

¹ Foreign value.

² Less than 1,000 (part time).

Stearic acid is produced, jointly with oleic acid, from animal and vegetable fats and oils, with glycerin and tar as byproducts. Inedible tallows and greases are the raw materials used in the United States.

Stearic acid is used in rubber products, candles, pharmaceuticals, cosmetics, shaving creams, lubricants, paint and related products, buffing compounds, polishes, sizings, phonograph records, and for miscellaneous purposes. The fatty acids of hydrogenated fish oils compete with stearic acid in some of its uses, as in the production of rubber products.

United States consumption of stearic acid has responded to changes in the national income, probably because of the wide range of uses. Consumption has increased during the war; it is estimated to have been about 55 million pounds in 1943.

United States production has always supplied the great bulk of our consumption. The relatively small imports have come chiefly from the United Kingdom and the Netherlands.

POST-WAR SHORT TERM

United States consumption is likely to be somewhat less than during the war but substantially higher than in 1939. Imports are likely to be relatively less important than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

The price of fats and oils, the raw materials for the production of stearic acid, has a considerable effect on the price of stearic acid. Prices of fats and oils were somewhat depressed in 1939. Probably they will be about 10 percent above the prices in 1939 at the 1939 income level and about 10 percent below the prices in 1939 at the high income level. Increases in prices of stearic acid might be about 10 percent above those of 1939 at both income levels.

Per capita income at 1939 level.

Consumption of stearic acid will probably be only moderately higher than in 1939 and may possibly be 37-38 million pounds, depending in part on the assumption as to the duty.

Duty as in 1939.—It is likely that imports of stearic acid would probably be a little more than 1.3 million pounds, constituting about 3.5 percent of consumption, with a foreign value of about \$120,000 at a price of 9.2 cents per pound. United States production for the domestic market might be about 36 million pounds, valued at about 4.1 million dollars at 11.5 cents per pound.

Duty reduced by 50 percent.—Imports might be about 3 million pounds, constituting about 8 percent of consumption, with a foreign value of about \$275,000 at a price of 9.2 cents per pound. Production for the domestic market would probably be about 34 million pounds, with a value of 3.9 million dollars at a price of 11.5 cents per pound.

Duty increased by 50 percent.—Imports might be reduced to less than 500,000 pounds, constituting a little more than 1 percent of consumption, with a foreign value of less than \$46,000 at a price of 9.2 cents per pound. Production for the domestic market might be about 36.5 million pounds, valued at 4.2 million dollars at a price of 11.5 cents per pound.

Per capita income 75 percent higher than in 1939.

Consumption might be about 50 percent higher than in 1939 and might total 50-52 million pounds, depending in part on the assumptions regarding the duty.

Duty as in 1939.—Imports might be about 4 percent of the increased consumption and might possibly be about 2 million pounds, with a foreign value of about \$185,000 at 9.2 cents a pound. Production for

the domestic market might be about 48-50 million pounds, valued at 5.5-5.8 million dollars at 11.5 cents a pound.

Duty reduced by 50 percent.—A 50-percent reduction in duty might result in an increase of imports to 4 million pounds, constituting about 8 percent of consumption, with a foreign value of \$370,000 at 9.2 cents per pound. Production for the domestic market might be about 47 million pounds, valued at 5.4 million dollars at 11.5 cents a pound.

Duty increased by 50 percent.—Imports might be about 1 million pounds, with a foreign value of \$92,000 at 9.2 cents per pound, and might constitute close to 2 percent of consumption. Production for the domestic market might be about 50 million pounds, valued at 5.8 million dollars at 11.5 cents a pound.

Exports

Exports of stearic acid in peacetime have been small. During the long-term post-war period they might be within the range of 1.3-2 million pounds, depending on world income and trade barriers.

Employment

Probably less than 1,000 persons are engaged in the production of stearic acid and the joint product, oleic acid, and byproducts glycerin and tar. On the basis of the above estimates, employment in the long-term post-war period would perhaps range from 1,000 to 1,500 persons, depending on the level of income.

VINYL ACETATE RESINS

Tariff paragraph: 2 and 11.

Commodity: Vinyl acetate, polymerized, and synthetic resins made in chief value from vinyl acetate, n. s. p. f.

Rate of duty: 3¢ per lb. plus 15% ad valorem. *Equivalent ad valorem (1939):* 22%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 6 cents per pound plus 30 percent ad valorem, which was reduced to 3 cents plus 15 percent, effective January 1, 1936, pursuant to the first trade agreement with Canada. The reduced rate was continued pursuant to the second Canadian agreement.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	17,500	0	17,500	370	7,870	Percent
Value (\$1,000).....	6,000		6,000	174		5
Unit value (per pound).....	\$0.80		\$0.80	\$0.46		
Persons employed (number).....	(¹)					

¹ Foreign value.

² Estimated as less than 250.

Polyvinyl acetate (vinyl acetate, polymerized), a resin made from vinyl acetate, is a synthetic organic chemical derived principally from acetylene and acetic acid.

Vinyl resins are used for protective coatings, insulants and jacketing for wire and cables, elastic belts, safety-glass interlayers, industrial filter cloths, textiles, and other purposes. The most important wartime application of the vinyl resins has been as a rubber replacement.

In 1939 the applications of vinyl resins were still largely unexplored. Since then, consumption and production have increased approximately tenfold. In 1939 about 5 percent of consumption was furnished by imports; in earlier years imports had been relatively more important owing largely to the fact that Canadian production developed earlier, and Canadians owned important United States patents in the vinyl field. The principal Canadian producer is now jointly owned by an American and a Canadian corporation as the result of a merger consummated in 1943. Imports of vinyl resins are now negligible and are not likely to be important in the post-war period.

The United States industry has tremendously expanded its production capacity in connection with the war production program and now apparently occupies a favorable world competitive position.

Synthetic resins in general and vinyl resins in particular still appear to be in the stage of rapid growth characteristic of a young industry. The rate of increase of production and consumption was rapid before the war; direct and indirect military uses have required considerable expansion during the war. The potential peacetime uses for development after the war are constantly increasing.

POST-WAR SHORT TERM

In the short-term period following the war, it seems likely that the wartime level of production of vinyl resins—a total of about 50–75 million pounds annually—will be maintained. The speed at which natural and synthetic rubbers are made available may somewhat affect consumption of these resins, but it seems likely that other potential uses will more than absorb the displacement caused by the availability of rubber.

POST-WAR LONG TERM

Consumption, Production, and Imports

It seems probable that imports will be quite small and will not be likely to increase even with a 50-percent reduction in duty.

Per capita income at 1939 level.

In view of the constant development of new and improved plastics, synthetic rubbers, and other competitive materials, it is difficult to predict the position any of them will occupy 8 or 10 years hence. Unless other materials should replace the vinyl resins in their most important present and potential applications, United States production for the domestic market and consumption might possibly be as large as 70–80 million pounds. Assuming that the unit value will be in the neighborhood of 35 cents per pound, the value of production for the domestic market may be within the range of 25–30 million dollars.

Per capita income 75 percent higher than in 1939.

United States production for the domestic market might go as high as 100 million pounds, or even higher, and might be valued at 30-40 million dollars.

Exports

There were no exports of vinyl resins in 1939, for the production of these resins in the United States at that time was in an early stage of development. United States exports of vinyl resins in the postwar period will depend to a considerable extent on how well Germany will be able to compete with the United States in the world market, and on how much that market will develop. Under favorable conditions, exportation of vinyl resins might well become a sizable trade, particularly if foreign tariffs were substantially reduced from their 1939 levels.

Employment

It is difficult to segregate the employees engaged in vinyl-resin production from those engaged in other production in the same plants, but the number may be roughly estimated to have been less than 250 factory workers, with the output at 1939 levels. With a production 10 times greater, the number of factory workers would probably not be more than triple the number employed in 1939.

MONOSODIUM GLUTAMATE (AJINOMOTO)

Tariff paragraph: 5.
Commodity: Ajinomoto and other monosodium glutamate preparations.
Rate of duty: 25% ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export ¹	For domestic market ¹			
Quantity (1,000 pounds).....	1,500	0	1,500	780	2,280	Percent 34
Value (\$1,000).....	1,500		1,500	² 680		
Unit value (per pound).....	\$1.00		\$1.00	\$0.88		
Persons employed (number).....	³ 100					

¹ Estimated.

² Foreign value.

³ Estimated as less than 100.

Monosodium glutamate is a hydrolized protein obtained from both vegetable and animal materials. Ajinomoto is the Japanese trade name for an almost pure form of monosodium glutamate. Monosodium glutamate preparations are used as a condiment for enriching or accentuating various food flavors; they have only a weak flavor in themselves but are particularly useful in enriching delicately flavored foods such as chicken and mushrooms.

Commercial production of monosodium glutamate is usually from wheat gluten, although soybean flakes, corn gluten, Steffen's waste, fish, casein, and other materials may be used. Wheat gluten and wheat starch are coproducts of wheat flour; Steffen's waste is the filtrate from the Steffen's process of beet-sugar manufacture. Other hydrolyzed proteins are somewhat competitive with the glutamates but are limited in their uses because of their strong flavor.

Monosodium glutamate has been practically unknown to the average housewife in the United States and almost the entire supply was consumed by food manufacturers. It is likely that in the postwar period the product will be sold not only to large food manufacturers but also as a household condiment, causing a rapid increase in consumption.

In 1939, imports constituted about one-third of the monosodium glutamate consumed in the United States.

Domestic production increased during the war in response to United States demand and to the cessation of imports. Although the competitive strength of the expanded domestic industry has yet to demonstrate itself, it is assumed in the following discussion of postwar probabilities that the domestic industry will tend to supply a larger proportion of consumption than before the present war.

In 1939, United States imports of monosodium glutamate from Japan amounted to 65 percent of the total imports of this material; those from China, 25 percent; and those from Hong Kong, 10 percent.

POST-WAR SHORT TERM

During the first few years following the war, the domestic consumption may be almost double the 1939 level; domestic production will probably account for around 95 percent of the total, and imports will supply the remaining 5 percent. Prices will be at a slightly higher level than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

It is assumed that manufacturing methods and the raw materials used in the production of monosodium glutamate will remain about the same as during the war. Greater consumption of monosodium-glutamate preparations would result from increased population, greater use of the commodity by food manufacturers, and more general household use. Consumption of this material might not be greatly affected by a 50-percent increase or decrease in the rate of duty, although the reduction in the duty would tend to narrow and an increase in duty would tend to widen the margin of net profit to United States producers because of the effect of the duty change on the United States price of the imported product.

Per capita income at 1939 level.

Domestic consumption of monosodium-glutamate preparations may be 75-150 percent larger than in 1939, or 4-6 million pounds annually.

Duty as in 1939.—Imports may account for about 15 percent of domestic consumption and amount to possibly 600,000-900,000 pounds, with foreign value of about \$530,000-\$790,000. Production

would probably amount to 3.1–5.4 million pounds annually, valued at about 3.1–5.4 million dollars.

Duty reduced by 50 percent.—If the duty on monosodium glutamate were reduced to 12½ percent ad valorem, imports might be expected to supply about 25 percent of consumption, or about 1.0–1.5 million pounds annually. Such imports would probably have a foreign value of 0.9–1.3 million dollars. In this situation, domestic production would likely be in the range of 2.5–5.0 million pounds annually, valued at about 2.5–5.0 million dollars.

Duty increased by 50 percent.—If the duty were increased to 37½ percent ad valorem, imports might supply about 10 percent of consumption, or 400,000–600,000 pounds annually. The foreign value is likely to be \$350,000–\$530,000. Domestic production would amount to about 3.4–5.6 million pounds annually, valued at around 3.4–5.6 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption would probably be about 5–7 million pounds annually, valued at 5½–8 million dollars assuming a 10-percent increase in price level over that of 1939.

Duty as in 1939.—Imports may possibly supply 15 percent of the domestic consumption, and amount to about 750,000 to 1 million pounds, valued at about \$660,000–\$880,000 annually (foreign value). Domestic production would amount to about 4–6.2 million pounds, valued at around 4.4–6.8 million dollars annually.

Duty reduced by 50 percent.—Imports might supply about 25 percent of the estimated domestic consumption, or about 1.2–1.7 million pounds annually. The foreign value of these imports would be about 1.2–1.6 million dollars. Domestic production would probably be 3.3–5.8 million pounds annually, with a value of about 3.6–6.4 million dollars.

Duty increased by 50 percent.—Imports under this assumption would probably account for only 10 percent of the estimated consumption, or about 500,000–700,000 pounds annually. The foreign value of the imports would probably amount to about \$485,000–\$680,000. Domestic production would in these circumstances increase to 90 percent of the consumption, or 4.3–6.5 million pounds, valued at about 4.7–7.1 million dollars.

Exports

Exports are negligible and probably consist mainly of exports by United States food manufacturers to their branch factories in foreign countries. It is not thought that they will increase significantly after the war.

Employment

The total number of factory employees for monosodium-glutamate in 1939 manufacture was probably in the neighborhood of 100. Under the maximum possibilities with respect to post-war production, the number employed in the production of this product would probably not exceed 450.

MEDICINAL PREPARATIONS AND SALTS

Tariff paragraph: 5.

Commodity: Vitamins and vitasterols; medicinal preparations of animal origin; medicinal preparations, n. s. p. f., not containing alcohol; salts and compounds of gluconic acid, etc.

Rate of duty: 15 to 25% ad valorem. *Equivalent ad valorem (1939):* 24%.

NOTE.—The 1930 Tariff Act rate of 25 percent ad valorem was reduced to 15 percent on gluconic acid salts and compounds, effective February 15, 1936, pursuant to the trade agreement with Switzerland; and to 12½ percent on medicinal preparations of animal origin, not specially provided for, effective November 15, 1941, pursuant to the trade agreement with Argentina. Medicinal preparations of animal origin which are the product of Cuba have been subject to the reduced rate of 10 percent ad valorem since January 5, 1942, pursuant to the trade agreement with Cuba.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	30,000	¹ 1,500	¹ 28,500	² 2,700	¹ 31,200	<i>Percent</i> 9
Persons employed (number).....	3,000					

¹ Estimated.

² Landed value; foreign value was \$1,919,000.

The commodities included in these classifications are the bulk pharmaceutical products which are made from non-coal-tar raw materials and from animal byproducts. Imports of gluconic acid salts and compounds accounted for about 9 percent of the total imports of bulk pharmaceuticals, and products of animal origin accounted for about 36 percent. Pre-war imports were principally from Switzerland, Germany, and France.

In 1939, the foreign value of imports amounted to about 9 percent of the value of United States consumption of the materials here considered. Imports were exceptionally high in that year, however, due to war-scare buying and the desire by United States pharmaceutical companies to build up large inventories. It is estimated, therefore, that, if these factors had not influenced the demand for imports, apparent consumption would have been about 30.3 million dollars and the ratio of imports to apparent consumption would have been about 6 percent. In recent years there has been a tendency to replace certain of the imported commodities either by similar domestic natural commodities or by synthetics. The general trend of prices of these pharmaceutical products has been downward.

POST-WAR SHORT TERM

United States consumption of these medicinal products in the short-term period will probably be somewhat larger than in 1939, but im-

ports will likely be less because the pharmaceutical industry in the United States has, during the war, initiated production of medicinals formerly imported.

POST-WAR LONG TERM

Consumption, Production, and Imports

Probably a 50-percent increase or decrease in the rates of duty would not markedly affect total imports or domestic consumption of medicinal preparations because there is a strong consumer preference for many of the imported products, some of which are not available from domestic sources.

Per capita income at 1939 level.

Consumption in the United States of those medicinals for compounding into finished preparations might be valued at 36.5 million dollars. This estimate is based on the belief that the industry will be able to retain part of its wartime gain even if national income drops back to 1939 levels. Imports might be about 4 percent of consumption, with a landed value of about 1.4 million dollars (equivalent to a foreign value of about 1 million dollars). United States production might amount to about 39 million dollars in order to supply the increased domestic consumption and a probable increase in exports.

Per capita income 75 percent higher than in 1939 with or without a change in duty.

United States consumption will probably be valued at approximately 46.8 million dollars. This estimate is based on the fact that consumption of medicinals tends to increase with an increase in per capita income. The landed value of imports might be about 1.8 million dollars, equivalent to a foreign value of about 1.3 million dollars. United States production might be valued at approximately 50 million dollars, allowing for exports.

Exports

United States exports of bulk pharmaceutical medicinals of non-coal-tar origin and those derived from animal byproducts have been principally to Central and South America. During the war exports increased considerably, but in the post-war long-term period it is probable that the United Kingdom and Germany will regain some of their former markets. However, exports are likely to be somewhat larger than before the war, particularly if there should be a higher world income and lower trade barriers.

Employment

Much of the production of this group of medicinals is by highly mechanized processes requiring comparatively little hand labor. In 1939, about 3,000 persons were employed in the manufacture of these products. Increased production in the post-war long-term period would result in only a very small increase in employment. The problem of supplying scientifically trained workers may prove to be a serious handicap to the industry in the post-war period.

AMMONIUM CHLORIDE

Tariff paragraph: 7.

Commodity: Ammonium chloride.

Rate of duty: 1½¢ per pound.

Equivalent ad valorem (1939): 56%.

GENERAL

Data for United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Appar-ent con-sumption	Ratio of imports to con-sumption
	Total	For ex- port	For do- mestic market			
Quantity (1,000 pounds).....	45,523	150	45,473	8,487	53,960	Percent 16
Value (\$1,000).....	2,051	2	2,049	191		
Unit value (per pound).....	\$0.045	\$0.045	\$0.045	\$0.023		
Persons employed (number).....	125-150					

¹ Estimated.² Foreign value.

Ammonium chloride is manufactured in two commercial grades, white and gray. There is also a small amount of a U. S. P. grade produced for use in medicinals and laboratory work. The white grade is used principally in dry-cell batteries for flashlights and portable radios and accounts for two-thirds to three-fourths of the domestic production of ammonium chloride. The gray grade, which is slightly more expensive, is consumed largely for galvanizing, soldering, and in the processing of textiles.

The bulk of the ammonium chloride is produced as a byproduct in the manufacture of soda ash (sodium carbonate) by the ammonia-soda process. In this process the quantity of ammonium chloride produced can be adjusted to demand, the excess being returned to the process and re-used in the production of sodium carbonate or sodium bicarbonate.

Domestic consumption of ammonium chloride has varied considerably owing to general economic conditions and variations in production of dry-cell batteries. In 1933, when the national income was low and when the introduction of all-electric radios had heavily cut the demand for dry batteries, consumption was 33 percent below that in 1939. After 1933, production of dry-cell batteries increased. Accordingly, 1939 is probably a fairly representative year for recent peacetime consumption of ammonium chloride.

Pre-war imports, which were approximately two-thirds of the white grade and one-third of the gray grade, were principally from Germany. Smaller quantities have been imported from Belgium, Poland, the United Kingdom, and Canada.

POST-WAR SHORT TERM

The consumption of ammonium chloride will probably be greater in the first few years after the war than in 1939 because of increased demand for dry-cell batteries and galvanized iron products, the supply

of which has been considerably restricted during the war. Imports are expected to fall as low as 20 to 40 percent of imports in 1939, for Germany, the principal source of our pre-war imports, will probably not be in a position to supply this material. Exports may increase somewhat in order temporarily to supply a portion of the world trade formerly supplied by Germany and Japan. Accordingly, domestic production will be higher. The price of ammonium chloride is not expected to change greatly.

POST-WAR LONG TERM

Consumption, Production, and Imports

Consumption of ammonium chloride in the United States has tended to increase as the national income has gone up and will probably continue the trend in the post-war long term. As domestic manufacturers of this compound have increased their productive capacity during the war, imports probably will not be able to regain their former proportion of the United States market. The ratio of imports to domestic consumption will probably be the same at both the low level and the high level of income.

Per capita income at 1939 level.

Domestic consumption of ammonium chloride may be as much as 60-65 million pounds at this level of income, taking into account a 10-percent increase in population. Changes in either direction in the rate of duty will probably not greatly affect domestic consumption. The price is likely to be about the same as in 1939.

Duty as in 1939.—Imports will probably not be more than 2-3 percent of domestic consumption, or 1-2 million pounds, with a foreign value of \$23,000-\$45,000 at 1939 prices if no imports are received from Germany, and will very likely not be more than 5-8 percent of consumption, or 3-5 million pounds, with a foreign value of \$70,000-\$115,000 at 1939 prices if Germany is an important source. United States production for the domestic market is therefore likely to be 55-64 million pounds, valued at about 2.5-2.9 million dollars at 1939 prices.

Duty reduced by 50 percent.—Imports of ammonium chloride might be twice as large a proportion of domestic consumption as under the 1939 duty. Thus they might constitute as much as 4-6 percent of consumption and amount to 2½-4 million pounds, with a foreign value of \$57,000-\$92,000 at 1939 prices if Germany should not be an important source of our imports. If Germany should be an important source, imports might constitute 8-12 percent of consumption and amount to 5-8 million pounds, with a foreign value of \$115,000-\$184,000 at 1939 prices. United States production for the domestic market might be 52-63 million pounds, valued at about 2.3-2.8 million dollars at 1939 prices.

Duty increased by 50 percent.—If the import duty on ammonium chloride were increased by 50 percent, resulting in a rate of \$1.87½ per 100 pounds, imports of this product would probably fall to less than 1 percent of consumption since the imported material, which has had a foreign value of only \$2.30 per 100 pounds, could not com-

pete with the domestic product over an equivalent ad valorem rate of 80–85 percent. Imports might be about 600,000 pounds with a foreign value of about \$14,000 at 1939 prices. United States production for the domestic market might be about 60–64 million pounds, valued at 2.7–2.9 million dollars at 1939 prices.

Per capita income 75 percent higher than in 1939.

The domestic consumption of ammonium chloride may be 20–40 percent above that in 1939, or 65–75 million pounds. This estimate is based on the changes in the relation of consumption to national income as shown in past years. There is no reason to expect any appreciable change in consumption or any significant change in price if the rate of duty is raised or lowered by 50 percent.

Duty as in 1939.—Imports will probably be within the range of 1.5–2.5 million pounds, with a foreign value of \$35,000–\$58,000 at 1939 prices if Germany supplies none of this product, and will be roughly double those amounts in both quantity and value if Germany is a supplier. United States production for the domestic market might be about 60–73 million pounds, valued at about 2.7–3.3 million dollars at 1939 prices.

Duty reduced by 50 percent.—Imports of ammonium chloride in the post-war long-term period will probably be 2½–4½ million pounds, with a foreign value of \$57,000–\$104,000 at 1939 prices if the duty is reduced by 50 percent and Germany is not an important source of United States imports. With German imports, 5–9 million pounds of this material will probably be imported, with a foreign value of \$115,000–\$207,000 at 1939 prices. United States production for the domestic market might be 56–72 million pounds, valued at about 2.5–3.2 million dollars at 1939 prices.

Duty increased by 50 percent.—Ammonium chloride imports will very likely be less than 1 percent of consumption if the duty is increased by 50 percent, or about 700,000 pounds with a foreign value of about \$16,000 at 1939 prices. United States production for the domestic market might be 64–74 million pounds, valued at about 2.9–3.3 million dollars at 1939 prices.

Exports

Exports of ammonium chloride during 1939 were not separately classified and were very small, probably in the neighborhood of 50,000 pounds. There will probably be a considerable increase in exports during the immediate post-war period, estimated at 2–4 million pounds, in order to supply certain markets formerly supplied by Germany and Japan. In the long-term post-war period exports will probably be small as they were in pre-war times.

Employment

The number of employees engaged in the production of ammonium chloride is estimated to have been between 125 and 150 during 1939. This number will probably increase to almost 200 in the immediate post-war years and then decline to 150–175 in the long-term post-war period.

GUM ARABIC OR SENEGAL

Tariff paragraph: 11.

Commodity: Gum arabic or senegal.

Rate of duty: 0.5¢ per lb.

Equivalent ad valorem (1939): 7%.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	9,200
Value (\$1,000).....	1,635
Unit value (per pound).....	\$0.069

¹ Foreign value.

Gum arabic or senegal (acacia gum) is a widely used emulsifying, thickening, binding, and sizing agent. It is employed in the manufacture of confectionery, pharmaceuticals, adhesives, textiles, printing inks, water colors, kalsomines, matches, and so forth. For some uses, gum arabic is competitive with mesquite gum from Mexico, ghatti gum from India, and various water-soluble cellulose, starch, and dextrine derivatives made in the United States.

Gum arabic is obtained from various species of acacia trees. It comes chiefly from the Anglo-Egyptian Sudan (the world's principal source of supply) and the Senegal region of French West Africa.

The duty is so small (7 percent ad valorem in 1939) that a 50-percent increase or decrease is not likely to produce a change in price large enough to affect consumption.

POST-WAR SHORT TERM

In the short-term period immediately following the war, domestic consumption and imports of gum arabic will probably increase slightly. An assumed increase in the manufacture of confectionery products will probably cause increased consumption of gum arabic.

POST-WAR LONG TERM

Consumption and Imports

Since gum arabic is used in the manufacture of articles for direct consumption, such as confectionery, and also for industrial consumption, such as adhesives and textile sizes, the volume consumed is likely to increase both with population increases and increases in national income. Although substitutes are available for most uses, gum arabic is lower in cost than other satisfactory materials.

Per capita income at 1939 level.

Consumption and imports of gum arabic will probably show an increase as a result of the increase in population, and may be expected to be 5-15 percent more than the imports and consumption in 1939. This increase would put the imports at a level of 9.5-10.5 million pounds. Assuming a price of about 7 cents per pound, as in 1939, these imports would have a foreign value of \$650,000-\$750,000.

Per capita income 75 percent higher than in 1939.

With a national income 75 percent higher than in 1939, postwar consumption might be expected to be 20-40 percent greater in volume

than in 1939. Consumption and imports therefore may be expected to be 11-13 million pounds annually. Assuming that the price (foreign value) of imports will be 7.5-9 cents a pound, the foreign values of such imports would be from \$825,000 to 1 million dollars.

CASEIN

Tariff paragraph: 19.

Commodity: Casein.

Rate of duty: 5½¢ per lb.

Equivalent ad valorem (1939): 98%.

Note.—Reduced to 2¼ cents per pound by the trade agreement with Argentina, effective November 15, 1941.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	40, 878	(1)	40, 878	15, 532	56, 710	Percent 28
Value (\$1,000).....	4, 701	(2)	4, 701	886		
Unit value (per pound).....	\$0.12		\$0.12	\$0.06		
Persons employed (number).....	1, 000					

¹Negligible.

²Computed at domestic market prices.

³Foreign value.

⁴Approximate.

Casein is the washed, dried curd of skim milk that has been soured, naturally or by addition of acid, or coagulated with rennet. It is produced in a large number of small plants which usually manufacture casein only during the period of flush milk production, and in a small number of large continuous-process plants which also make other skim-milk products.

The price of casein is subject to wide variation. The 12 cents a pound given for 1939 is an average of prices as low as 8½ cents and as high as 19 cents per pound. In regions or in seasons of skim-milk surplus, casein plants receive their raw material in large volume and at low cost. But, when there is no surplus and manufacturers of cheese and of evaporated or dried skim milk are bidding against the casein plants, prices of casein go up to whatever point is necessary to fill the demand. At those times demand is met by diverting skim milk from alternative uses or by attracting imports of casein.

In 1939, 71 percent of the total consumption of casein was used for coated paper; 11 percent for plastics; 10 percent for glue; 4 percent for cold-water paint; 1 percent for insecticide sprays; and 3 percent for all other uses. But the pattern of use in 1944 is quite different as a result of the shortage of casein and other recent developments. The amount used for coated paper is now but one-fifth of the amount used in 1939, and much of the loss is probably permanent because of replacement by starch, which is less expensive. On the other hand two new uses have been developed: A synthetic woollike textile fiber

(trade name, Aralac) and a resin-emulsion paint together consumed 17-20 million pounds of casein in 1944.

Argentina has been the principal source of imports.

POST-WAR SHORT TERM

In the period immediately following the war the newly developed uses for casein probably will more than compensate for the decreased consumption by the paper industry. Consumption of casein will probably be considerably greater than in 1939, and both domestic production and imports are likely to be at higher levels than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

After the war United States consumption of casein is likely to vary with the general level of business activity as it has in the past. Consumption of casein in its old uses (allowing for a decline in the amount used for coating paper and for increases in its other established uses) can be estimated approximately. But to estimate the consumption of casein in the new synthetic fiber and in resin-emulsion surface coating is more difficult: although the demand for both of these products appears to be still expanding, this growth may be due in part to abnormal wartime conditions. It seems clear, however, that post-war consumption of casein will be considerably higher than consumption in 1939.

With increased United States consumption of casein, both domestic prices of casein and the foreign value of imports may be expected to increase more rapidly than the general price level. This divergence in prices will result from the need for additional supplies of skim milk either in the United States, in Argentina, or in both countries, in part by diversion from other uses.

Per capita income at 1939 level.

United States consumption of casein might be about 65 million pounds.

Duty as in 1939.—Imports might supply about 20-30 percent of consumption, or 13-20 million pounds. These imports would have a foreign value of about 1-1.6 million dollars at 8 cents per pound. United States production might be 45-52 million pounds, valued at about 6.3-7.3 million dollars at 14 cents per pound.

Duty reduced by 50 percent.—Imports might supply 30-40 percent of consumption, or about 20-26 million pounds, with a foreign value of about 1.8-2.4 million dollars at 9 cents per pound. United States production might be about 39-45 million pounds, valued at 5.1-5.9 million dollars at 13 cents per pound.

Duty increased by 50 percent.—Imports might supply 10-15 percent of consumption, or about 6-10 million pounds, with a foreign value of about \$420,000-\$700,000 at 7 cents per pound. United States production might be about 55-59 million pounds, valued at about 8.1-8.9 million dollars at 15 cents per pound.

Per capita income 75 percent higher than in 1939.

United States consumption of casein might be about 110 million pounds, almost double that of 1939.

Duty as in 1939.—Imports might supply 20-30 percent of consumption, or 22-33 million pounds, with a foreign value of about 2.9-4.3

million dollars at 13 cents per pound. United States production might be 77-88 million pounds, valued at 14.6-16.7 million dollars at 19 cents per pound.

Duty reduced by 50 percent.—Imports might supply 30-40 percent of consumption, or 33-44 million pounds, with a foreign value of about 5.0-6.5 million dollars at 15 cents per pound. United States production might be 66-77 million pounds, valued at about 11.9-13.9 million dollars at 18 cents per pound.

Duty increased by 50 percent.—Imports might supply 10-15 percent of consumption, or about 11-16 million pounds, with a foreign value of about 1.2-1.8 million dollars at 11 cents a pound. United States production might be 94-99 million pounds, valued at about 18.8-19.8 million dollars at 20 cents per pound.

Exports

Exports of casein are not separately reported in official statistics, but are believed to be negligible.

Employment

From 1,000 to 2,000 persons are employed in the casein industry, mostly on a part-time basis. Six men run a small casein plant and even the large plants require only 8 men each per shift. Possibly 200 men are given fairly steady employment by casein blenders, who grind, dry, sift, mix, and store the material. This number would scarcely be doubled (400) by the largest production estimate given above.

CHALK OR WHITING OR PARIS WHITE

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
20	Chalk or whiting or Paris white:		
	Dry, ground, or bolted.....	¼ of 1¢ per lb.	68%
	Precipitated.....	15% ad valorem.	15%

Notes.—The duties fixed by the Tariff Act of 1930 on chalk or whiting or Paris white were ¼ cent per pound for the dry, ground, or bolted, and 25 percent ad valorem for the precipitated. These rates were reduced to ¼ cent per pound, effective May 1, 1935, pursuant to the trade agreement with Belgium, and to 15 percent ad valorem, effective January 1, 1939, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export ²	For domestic market ³			
Quantity (1,000 pounds).....	273,430	2,087	268,723	25,470	293,208	Percent ⁴
Value (\$1,000).....	2,870	20	2,490	180		
Unit value (cents per pound).....	0.94	0.88	0.94	0.89		
Persons employed (number).....	200					

¹ Probably contains some limestone whiting.
² Estimated.
³ Partly estimated.
⁴ Foreign value.

The term "whiting" usually refers to true chalk whiting, which is made by grinding crude chalk, a soft variety of limestone. Limestone whiting (whiting substitute), made from other varieties of limestone, and precipitated chalk (precipitated whiting), a chemically manufactured product, are similar in chemical composition and properties to true chalk whiting. All three are manufactured in the United States; but only true-chalk whiting and precipitated chalk are imported in significant quantities and are the only products herein considered.

Chalk whiting is used largely in the manufacture of paints, rubber, putty, and paper, and for numerous other purposes of lesser importance. Precipitated chalk, which is more expensive than chalk whiting, is generally used for the same purposes.

United States consumption of chalk whiting has been declining since 1929, as chalk whiting has been replaced in many of its uses by limestone whiting and precipitated chalk. This shift has been accentuated during the war, partly because of the scarcity of imported chalk; and it is probable that many consumers who shifted from chalk whiting will continue to use the other whittings. United States consumption of precipitated chalk has increased in recent pre-war years, more than offsetting the decline in the consumption of chalk whiting.

United States production of chalk whiting is from imported chalk as there are few, if any, domestic deposits of high-grade crude chalk. Large quantities of precipitated chalk are produced in the United States from limestone, the primary raw material, which is abundantly available.

In recent pre-war years Belgium and the United Kingdom have supplied more than 85 percent of the United States imports of whiting. The United Kingdom has supplied more than 94 percent of the United States imports of precipitated chalk.

POST-WAR SHORT TERM

Consumption, imports, and production of whiting and precipitated chalk taken together are likely to be larger than in 1939, owing to the large deferred civilian demand for products which contain these materials.

POST-WAR LONG TERM

Consumption, Production, and Imports

The combined consumption of chalk whiting and precipitated chalk has varied somewhat with national income and has shown an upward trend (1933-39) notwithstanding the decrease in the consumption of chalk whiting alone. For precipitated chalk United States production has supplied a larger part of consumption than it has for chalk whiting.

Per capita income at 1939 level.

Consumption of chalk whiting and precipitated chalk is likely to be about 275-325 million pounds.

Duty as in 1939.—Imports may be expected to be about 8.5 percent of consumption or about 25 million pounds, with a foreign value of \$148,000 at 1939 prices. On the basis of these estimates, production for the domestic market would be about 250-300 million pounds, with a value of 2.3-2.8 million dollars at 1939 prices.

Duty reduced by 50 percent.—A reduction in duty on precipitated chalk probably would not have a marked effect on imports of this product as the ad valorem duty is small (15 percent); however, a reduction in duty on chalk whiting probably would increase substantially the imports of that product. Imports of the two commodities might then be about 10.5 percent of consumption or about 31 million pounds, with a foreign value of \$183,000 at 1939 prices. Production for the domestic market might be about 244–294 million pounds with a value of 2.3–2.8 million dollars.

Duty increased by 50 percent.—An increase in the comparatively low duty on precipitated chalk probably would not have a marked effect on imports; an increase in duty on chalk whiting, on the other hand, probably would decrease imports materially. Imports of both products probably would be about 6.4 percent of consumption, or about 19 million pounds, with a foreign value of \$112,000. Production for the domestic market might be about 256–306 million pounds valued at 2.4–2.9 million dollars.

Per capita income 75 percent higher than in 1939.

At this income level, the consumption of chalk whiting and precipitated chalk probably will be about 50 percent higher than in 1939, or about 400–470 million pounds.

Duty as in 1939.—Imports might be about 8.5 percent of consumption, or 37 million pounds, with a foreign value of \$248,000. On the basis of these estimates, production for the domestic market would be about 363–433 million pounds, with a value of about 3.8–4.6 million dollars, allowing for a higher price of 1.06 cents per pound.

Duty reduced by 50 percent.—Imports probably would be about 10.5 percent of consumption, or 46 million pounds, with a foreign value of \$308,000. Production for the domestic market probably would be about 354–424 million pounds, valued at 3.8–4.5 million dollars at 1.06 cents per pound.

Duty increased by 50 percent.—Imports probably would be about 6.4 percent of consumption, or 28 million pounds, with a foreign value of \$188,000. Production for the domestic market probably would be about 372–442 million pounds, valued at 3.9–4.7 million dollars at 1.06 cents per pound.

Exports

Exports of whiting or precipitated chalk are not separately classified. Canadian import statistics show 9.7 million pounds of whiting received in 1939 from the United States.

With world income at the 1939 level, exports in the long-term post-war period probably will be about the same as in 1939, or about 10 million pounds, valued at about \$83,000 at 1939 prices. With world income 75 percent above 1939, exports might be 50 percent above 1939, or about 15 million pounds, valued at about \$141,000.

Employment

There are no official statistics of the employment in this industry, but it is estimated that 175–200 wage earners in 1939 were engaged in the production of chalk whiting and precipitated chalk. Under the assumed conditions, employment probably would range from about the same number as in 1939 to one-third more.

CHEMICALS AND DRUGS IN PILLS, CAPSULES, ETC.

Tariff paragraph: 23.

Commodity: Chemicals, drugs, medicinals and similar substances, in capsules, pills, tablets, lozenges, etc.

Rate of duty: 25% ad valorem.

NOTE.—The general rate fixed in the Tariff Act of 1930 was 25 percent ad valorem, Cuban products being entitled to a preferential rate of 20 percent. The rate on medicinal preparations of animal origin, not specially provided for, in pills, capsules, etc., was reduced to 10 percent, effective January 5, 1942, pursuant to trade agreement with Cuba. This reduction applies to Cuban products only.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	103,046	3,957	99,089	1,436	99,525	Percent 0.4
Persons employed (number).....	10,000-11,000					

1 Foreign value.

Products under this classification include a wide variety of medicinal and chemical preparations put up in capsules, tablets, ampoules, or similar forms but consist chiefly of proprietary medicinals, including gland extracts, in the form of prepared doses. The statistics of production, exports, and imports shown in the foregoing tabulation relate largely to medicines in prepared doses and are approximately but not strictly comparable. Statistics of imports are given in terms of foreign value; but, even if they were on the same basis as the statistics of production and exports, they would have supplied in 1939 less than 1 percent of domestic consumption. Statistics of quantity are not available. Pre-war imports were principally from the United Kingdom, Germany, France, and Switzerland.

In the past, the consumption of medicines in prepared doses has fluctuated with the national income; but the trend in per capita consumption has been upward, and this upward trend is likely to continue after the war.

POST-WAR SHORT TERM

United States consumption of medicinals in prepared doses will probably be considerably larger than it was in 1939, owing principally to a higher national income. Imports will probably be less than half of those in 1939. Germany will not be in a position to supply significant quantities of these pharmaceutical preparations and the other European countries will probably have only comparatively small quantities available for export. Exports from the United States will probably increase considerably above those in 1939 in order to supply some of the markets formerly supplied by European countries, particularly markets in South America. Accordingly, domestic production will probably be much greater than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

United States consumption of medicines in prepared doses has been supplied almost entirely by domestic production; in recent years imports have furnished less than 1 percent of consumption. The sale of foreign medicines in prepared doses depends largely on the demand of foreign-born persons, comparatively small in number, who prefer proprietary remedies with which they became familiar abroad. Most of the population prefer domestic preparations. To most consumers the price is of secondary importance. It is doubtful whether a 50-percent increase or decrease in the duty would have much, if any, effect on consumption or imports. With a 50-percent decrease, imports might approach the maximum, and with a 50-percent increase they might approach the minimum.

Per capita income at 1939 level.

Consumption in the 1950's of medicinals and drugs in prepared doses may reach a value of as much as, say, 110-125 million dollars. This possibility allows for an increase in the population and for the increasing tendency of the people toward the use of medicinals in the form of prepared doses. United States imports might amount to \$500,000-\$600,000, foreign value. This value is based on the assumption that German production of medicinals will not be restricted or, if so, that imports from Germany will be replaced by imports from other countries. In these circumstances United States production would amount to 115-130 million dollars in order to supply the increased domestic consumption and a probable increase in exports.

Per capita income 75 percent higher than in 1939.

Consumption would probably increase to 125-150 million dollars. Imports might amount to \$600,000-\$800,000. Production, allowing for the probable increase in exports, would be valued at 130-155 million dollars.

Exports

Exports, which are principally to Canada and South America, have increased considerably during the war and are expected to remain at almost the same value in the immediate post-war period. However, during the post-war long-term period the European countries will probably regain a large proportion, but not all, of their former markets, and the value of United States exports will amount to about 5-6 million dollars, which would represent an increase of 25-50 percent above the 1939 level.

Employment

Production is largely by machinery, and employment will probably not increase in proportion to any increase in output. Production 50 percent greater in value than in 1939 would probably result in only a 5-15 percent increase in employment. The maximum number of persons employed in both the manufacture and distribution of these medicinal preparations will probably not exceed 12,000-13,000 in the post-war years.

COAL-TAR INTERMEDIATES

Tariff paragraph: 27(a).

Commodity: Coal-tar intermediates used for making finished coal-tar products such as dyes, medicinals, photographic chemicals, and perfume and flavoring materials.

Rate of duty: 7¢ per lb. plus 40% ad valorem. Equivalent ad valorem (1939): 45%.

NOTE.—All ad valorem rates under paragraph 27 are based on American selling price or on United States value (see text).

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	607, 175	5, 585	601, 590	2, 591	604, 181	Percent 0. 4
Value (\$1,000).....	191, 078	1, 248	199, 828	3, 034		
Unit value (per pound).....	\$0. 15	\$0. 22	\$0. 15	\$1. 17		
Persons employed (number).....	7, 000					

¹ Estimated.

² Foreign value.

Most finished coal-tar products pass through several chemical steps or stages. Each stage results in an intermediate, which in turn becomes the raw material of the next stage. Ordinarily these intermediates are not sold as such since producers find it more profitable to carry through to the finished products. In international trade it is sometimes economical to import an intermediate because the duty on it is relatively lower than that on the finished product.

The coal-tar intermediates are organic chemicals derived from coal tar used to produce dyes, medicinals, photographic chemicals, synthetic resins, flavors or perfumes, and other finished coal-tar products.

United States production of coal-tar intermediates in 1939 was 607 million pounds. Of the 65 firms engaged in this production, the 6 largest accounted for about 80 percent of the total. The bulk of this production was consumed in the producing plants; sales in 1939 amounted to 269 million pounds. Production in 1943 was about 250 percent of that in 1939.

United States imports of coal-tar intermediates were less than 1 percent of domestic sales in 1939 and consisted chiefly of azo salts, fast-color bases, fast-color salts, textile assistants, and naphthol derivatives. This extremely low ratio is due not only to the size and efficiency of the United States industry but also to the restrictive effects of the duty rates applied to imports. Three special points with regard to these rates should be noted: (1) The specific part of the compound rate virtually bars imports of low unit value. In 1939

the estimated average unit value of the domestic output was 15 cents per pound and that of exports was 22 cents per pound. On imports valued for duty purposes at 15 cents per pound, the duty would be 13 cents, or 87 percent ad valorem; on imports valued at 22 cents per pound, the duty would be 15.8 cents, or 72 percent ad valorem. (2) If the foreign intermediate is competitive, that is, if any similar product is produced in the United States, the ad valorem part of the compound duty is applied to the American selling price of the similar domestic product (not to the foreign value of the imported article, as is the usual rule with imports into the United States). The foreign producer's net return after payment of this duty and other expenses of exporting, will, therefore, usually be considerably less than half of the American selling price. Since the foreign producer can seldom afford to sell for less than half the price of the United States producers, current rates shut out most competitive coal-tar intermediates. (3) If an intermediate is not produced in the United States the ad valorem part of the compound duty is applied to the United States value (the domestic price of the imported product), less the duty and costs of shipping it to this market). The failure to produce an intermediate in the United States may be due to foreign ownership of a patent; to a secret foreign production process, particularly on a new product; or to consumption in such small volume that domestic producers do not care to produce it. Most of the imports of intermediates has been of these noncompetitive products with relatively high unit values. They came principally from Germany and Switzerland.

POST-WAR SHORT TERM

A large deferred demand for consumer products made from coal-tar intermediates will probably result in a considerable increase in the consumption of intermediates compared with the consumption in 1939. Imports will very likely be small.

United States exports of intermediates in the short-term period are likely to be larger than usual because of the probable large foreign demand for chemical products. Germany will probably be eliminated as a factor in this export trade for some time after the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

United States consumption and production of synthetic organic chemicals will probably be considerably expanded after the war. Wartime developments are almost certain to increase the number of synthetics that will be used in everyday life, replacing materials heretofore derived from other sources. This change will probably result in an increase in the output of intermediates necessary to make these products.

The interruption or destruction of the formerly established trade channels with Germany will tend to decrease imports of coal-tar intermediates from pre-war levels, and there is little likelihood of substantial imports of these products, even if the rates of duty are decreased by 50 percent. On the other hand, this reduction in rates might stimulate imports of noncompetitive intermediates of lower

unit values than it has heretofore been profitable to import. The total value of noncompetitive imports is not likely to be larger in relation to United States production, since a noncompetitive item becomes competitive as soon as domestic production is initiated.

In view of the fact that domestic production of many of the formerly noncompetitive intermediates has been developed during the war, and of the probability that some control will be exercised over the German chemical industry, it seems likely that the future volume of imports, particularly those from Germany, will be lower than in 1939. If conditions in foreign chemical industries return to normal, new products will probably be developed to offset part of these losses.

Per capita income at 1939 level.

Because of increased demand for products made from intermediates, United States consumption will probably be in the neighborhood of 1 billion pounds per year, or about 60 percent higher than the consumption of 1939. These requirements will be supplied almost entirely by domestic production. With an assumed average unit value of approximately 15 cents per pound, this production for the domestic market would be valued at about 150 million dollars.

The volume of imports will probably be 1.5-2 million pounds. With the unit value estimated at about the 1939 level (\$1.15 per pound), the value of these imports would be 1.7-2.3 million dollars. If duties were reduced or increased by 50 percent, only a moderate increase or decrease in imports is likely to result, and that almost entirely in noncompetitive items.

Per capita income 75 percent higher than in 1939.

It is anticipated that the trend in the consumption of intermediates will exceed the general average consumption level. Consumption and United States production for the domestic market will probably be close to the peak wartime output of 1.5 billion pounds. Since the trend of prices in the organic chemical industry has been downward, notwithstanding the upward trend in the general price level, the average unit value of these intermediates will probably not be higher than 15 cents per pound. The value of domestic production would accordingly be about 225 million dollars.

Imports under these conditions would probably be about 2½-3½ million pounds. Assuming a unit value of about \$1.25 per pound, the value of these imports would be 3.1-4.4 million dollars.

Exports

Although much depends on the future status of the German industry, it is anticipated that the United States will retain a substantial part of our present wartime markets which were formerly supplied by Germany. If the world income in the long-term period is the same as in 1939 and world trade barriers are not increased, United States exports of intermediates will probably be 200-300 percent of 1939. Should the world income be substantially higher than in 1939, the range of such exports may be 300-400 percent of those of 1939.

Employment

It is difficult to separate the employees engaged in the manufacture of intermediates from those engaged in the manufacture of synthetic

organic products such as dyes, medicinals, and flavors. However, the number of factory workers engaged in the manufacture of intermediates in 1939 is estimated to have been about 7,000. The number now engaged in this industry is estimated to be about 10,000; at least this number of employees would be required to produce the quantities estimated under a post-war income 75 percent higher than in 1939.

FINISHED COAL-TAR PRODUCTS

Tariff paragraph: 28.

Commodity: All finished coal-tar products such as dyes, medicinals, photographic chemicals, plastics, and flavoring materials.

Rate of duty: 3¢ per lb. plus 20% ad valorem to 7¢ per lb. plus 45% ad valorem. *Equivalent ad valorem (1939):* 45%.

NOTE.—All ad valorem rates under paragraph 28 are based on American selling price or on United States value (see text). The Tariff Act of 1930 prescribed a rate of 45 percent ad valorem plus 7 cents per pound for the entire paragraph, except that synthetic indigo and sulfur black were dutiable at 3 cents per pound plus 20 percent ad valorem. The trade agreement with Switzerland, effective February 15, 1936, provided for the following reduced duties: On colors, dyes, and stains, except synthetic indigo and sulfur black—40 percent ad valorem, but not less than 3¼ cents per pound plus 22¼ percent ad valorem; on artificial musk—22¼ percent ad valorem plus 7 cents per pound; and on heliotropin—22¼ percent ad valorem plus 3¼ cents per pound.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	437,867	19,823	418,044	5,481	423,525	<i>Percent</i> 1.3
Value (\$1,000).....	¹ 179,525	8,379	¹ 171,146	² 8,663		
Unit value (per pound).....	¹ \$0.41	\$0.42	¹ \$0.41	² \$1.58		
Persons employed (number).....	20,000					

¹ Estimated.
² Foreign value.

The coal-tar products covered in this section include dyes and colors, medicinals, photographic chemicals, flavors and perfume materials, resins and plastics, rubber chemicals, and all other miscellaneous finished coal-tar products. Coal-tar intermediates (par. 27) are described in a separate section.

United States production supplies all but 1 or 2 percent of United States consumption of these finished coal-tar products. In 1939, United States production was 438 million pounds, valued at approximately 180 million dollars. In 1943, production of the same products was 985 million pounds¹ valued at approximately 432 million dollars, an increase of 125 percent in quantity and 141 percent in value over the 1939 figures.

Future consumption and production of coal-tar products in the United States may be higher in relation to the prevailing national income than they have been in the past. There is likely to be an

¹ Does not include synthetic rubbers or explosives derived in whole or in part from coal tar.

increase in the number of coal-tar synthetics used in everyday life. The value of coal-tar products may well increase more than their volume, owing to the production of a larger proportion of higher priced products, such as the more expensive vat dyes and synthetic medicinals (for instance, the antisyphilitics, vitamins, and anti-malarials).

United States imports of all finished coal-tar products, in terms of quantity, have usually been equivalent to less than 2 percent of the domestic output. More than 90 percent of these imports have consisted of coal-tar dyes and about 5 percent have consisted of coal-tar medicinals and photographic chemicals. Separate data on the United States production, imports, and consumption of these two groups of chemicals for 1939 follow:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	156,932	17,062	139,870	5,155	145,025	Percent 3.6
Value (\$1,000).....	¹ 106,015	7,188	¹ 98,827	² 8,439		
Unit value (per pound).....	¹ \$0.68	\$0.42	¹ \$0.71	\$1.64		
Persons employed (number).....	¹ 10,000					

¹ Estimated.

² Foreign value.

The low ratio of imports to consumption—3.6 percent for coal-tar dyes, medicinals, and photographic chemicals and only 1.3 percent for all finished coal-tar products, combined—is due not only to the size and efficiency of the United States industry but also to the restrictive effects of the duty rates applied to imports. Two special points with regard to these rates should be noted: (1) If the foreign product is competitive, that is, if any similar product is produced in the United States, the ad valorem duty is applied to the American selling price of the similar domestic product (not to the foreign value of the imported article, as is the usual rule with imports into the United States). The foreign producers' net receipts after payment of this duty and the other expenses of exporting will, therefore, usually be less than half of the American selling price. Since the foreign producer can seldom afford to sell for less than half the price received by the American producer, current rates shut out most competitive coal-tar products. (2) If a coal-tar product is not produced in the United States, the ad valorem duty is applied to the United States value (the domestic price of the imported product, less the duty and costs of shipping it to this market). The failure to produce a product in this country may be due to foreign ownership of a patent; lack of knowledge of production, particularly in a new product; or to such limited demand that domestic producers do not care to make it. Most of the imports of coal-tar products have been of these non-competitive products.

Germany and Switzerland have been the principal sources of imports.

In view of the wartime expansion in the domestic production of many of the formerly imported noncompetitive products, the prob-

ability of widespread destruction of Japanese and German production facilities, and the probability of post-war control over these facilities, it seems likely that the volume of imports will be less in the post-war than in the pre-war period. When conditions in foreign chemical industries return to normal, new products may be developed which will partly offset these losses.

POST-WAR SHORT TERM

Finished coal-tar products will probably be produced in quantities considerably larger than in 1939. Increased production of dyes over the 1939 level will be necessary to finish the textiles which will be required to meet a large deferred demand in the home market, and for a probable expanded volume of finished textile exports. Coal-tar plastics and resins and coal-tar medicinalals are also likely to be produced in considerably larger volume than in 1939.

United States exports of finished coal-tar products will tend to be considerably larger than before the war because of the deferred demand for these products and the probable drop in German and Japanese exports.

POST-WAR LONG TERM

Consumption, Production, and Imports

United States consumption and production of coal-tar products after the war may be expected to continue the post-war trends and also to show marked response to increases in the national income.

Imports of coal-tar products are likely to be relatively less important than before the war. The established channels of trade with Germany have been largely destroyed. With the duty on competitive imports assessed on the American selling price, even a 50-percent reduction in rates of duty might have little effect. Noncompetitive imports will probably not increase greatly because a noncompetitive item becomes competitive as soon as domestic production is initiated.

Per capita income at 1939 level.

It is likely that United States production of all finished coal-tar products for the domestic market will be in the neighborhood of 650 million pounds (a 50-percent increase over 1939), which at 40 cents per pound would be valued at about 260 million dollars. Imports will probably be 3-5 million pounds, depending partly on the assumed rate of duty. With the unit value estimated at about the 1939 level (\$1.58 per pound), the value of these imports would be 4.7-7.9 million dollars.

Per capita income 75 percent higher than in 1939.

United States production of finished coal-tar products for the domestic market will probably approach the peak wartime output to reach a volume in the neighborhood of 1¼ billion pounds. Assuming that a larger proportion of high-priced products will be manufactured, the unit value of this production might be about 50 cents per pound, giving a total value of about 625 million dollars.

Imports under these conditions would probably be 4-8 million pounds, depending partly on the assumed rate of duty. Assuming a unit value of \$1.75 per pound, the value of these imports would be 7-14 million dollars.

Exports

Before the war, world trade in finished coal-tar products was largely controlled by the International Dye Cartel and other similar cartel arrangements centering in the German chemical industry. While a great deal depends on the future status of the German industry and the extent to which world trade will be freed from restrictive practices, the United States may retain a substantial part of the wartime markets formerly chiefly supplied by Germany. These considerations indicate that exports of finished coal-tar products may reach a level as high as 100 million pounds, an increase of about 400 percent over the corresponding 1939 volume. With an assumed unit value of 40 cents per pound these exports would be valued at about 40 million dollars.

Employment

It is difficult to separate the employees engaged in the manufacture of finished coal-tar products from those engaged in the manufacture of closely related products such as coal-tar intermediates and coal-tar crudes. However, the number of factory workers engaged in the manufacture of finished coal-tar products in 1939 is estimated to have been about 20,000. The number of factory workers currently engaged in this industry is estimated to be in the neighborhood of 25,000; at least this number of employees, if not more, would be required to produce the quantities estimated under a post-war income 75 percent higher than in 1939.

COBALT OXIDE

Tariff paragraph: 29.

Commodity: Cobalt oxide.

Rate of duty: 10¢ per lb.

Equivalent ad valorem (1939): 9%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 20 cents per pound, which was reduced to 10 cents, effective January 1, 1936, pursuant to the first trade agreement with Canada. The reduced rate was continued pursuant to the second Canadian agreement.

GENERAL

Data for United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 500	0	1 500	681	1,181	<i>Percent</i> 58
Value (\$1,000).....	2 850		2 850	3 045		
Unit value (per pound).....	1 70		1 70	1 39		
Persons employed (number).....	100					

¹ Estimate of production from imported raw materials.

² Estimated.

³ Foreign value.

⁴ Based on domestic market quotations.

⁵ Less than 100.

Cobalt oxide is used principally as a glaze or enamel in the ceramics industry and as a pigment in the glass industry. It is also used as a catalyst and in the manufacture of cobalt chemicals. Cobalt salts derived from the metal or oxide are employed in the preparation of

paint driers, and as cattle and plant food, chemical reagents, and catalysts.

Cobalt oxide is produced from cobalt ore concentrates (described separately under tariff paragraphs 1652 and 1664), all of which are imported. Before the war, the concentrates came principally from Belgium and Canada, but since 1941 they have come principally from the Belgian Congo and Northern Rhodesia. In pre-war years, United States imports of cobalt oxide came from Belgium, Germany, France, and Finland.

Before the war, international trade in cobalt was controlled by the International Cobalt Association, composed of Belgian, English, French, and Canadian producers. The association, working in agreement with the German Cobalt Producers Association, controlled about 90 percent of the world's cobalt; it regulated prices and world trade in both cobalt oxide and the ores and residues from which it is produced.

POST-WAR SHORT TERM

In the period immediately after the war, consumption of cobalt oxide is likely to increase substantially because many of the nonessential uses of cobalt oxide have been curtailed drastically by wartime restrictions. This increase in consumption is likely to be shared by domestic production from imported raw materials and by imports from Canada. Imports of cobalt oxide are likely to form a lower proportion of consumption than before the war: Imports from Europe will probably be small since most of the producing facilities have been disrupted by the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

In the past, consumption of cobalt oxide has varied with the national income. It does not seem probable that there will be important new uses to change the post-war outlook for consumption.

If the International Cobalt Association, or any similar group, should control production and prices after the war as they did before, it could increase or decrease the profit of United States producers by shifting the margin between raw material and oxide prices. Assuming, however, that a cartel operating after the war would pursue about the same policy as the association did before the war, production and imports would probably supply about the same proportion of consumption in the post-war as in the pre-war period.

The same prediction would probably hold if the cartel should not be reestablished after the war, for past experience suggests that prices of both cobalt concentrates and oxide would go down generally in the same proportion. Nor would the proportion of production and imports be much altered if the duty should be increased or decreased by 50 percent.

Per capita income at 1939 level with or without a change in duty.

Consumption is likely to be about the same or slightly higher than in 1939 and to be 1.2-1.5 million pounds. Imports may be somewhere between 650,000 and 1 million pounds of cobalt oxide and may account for 45-85 percent of consumption. With the great uncertainty as to prices, imports might have a foreign value of \$485,000-\$1,400,000, with a unit value of \$0.75-\$1.40 a pound.

With consumption and imports in the magnitudes indicated, United States production for the domestic market would amount to 200,000–850,000 pounds (40–170 percent of 1939 production, and from 15–55 percent of consumption), valued at \$200,000–\$1,445,000, at \$1.00–\$1.70 a pound.

Per capita income 75 percent higher than in 1939 with or without a change in duty.

Consumption of cobalt oxide would probably increase 65–85 percent above 1939 and would be 2.0–2.2 million pounds. Imports may be expected to increase to 1.1–1.5 million pounds, or to 60–120 percent above the 1939 level and 50–75 percent of consumption. Probably the upper level of the possible range of prices of cobalt oxide might be somewhat higher, and the foreign value of the imports, therefore, might be within the range of \$825,000–\$2,400,000, with a unit value of \$0.75–\$1.60 a pound. United States production for the domestic market, therefore, would total 0.5–1.1 million pounds (100–220 percent of the 1939 level, and 25–50 percent of consumption), with a value of 0.5–2.2 million dollars, at \$1–\$2 a pound.

Exports

Exports of cobalt oxide are not large and are not likely to increase after the war.

Employment

The number of employees engaged in the production of domestic cobalt oxide is not available, but is believed not to exceed 100. A 40–80 percent increase in the post-war production would result in only a small increase in the number of wage earners, for the production is highly mechanized.

PLASTICS PRODUCTS, NOT SPECIALLY PROVIDED FOR

Tariff paragraph: 31 (a), (2), 31 (b) (2), 33, 1536, 1539 (a), 1539 (b), and 1558.

Commodity: Articles, not specially provided for, of cellulose acetate, other cellulose combinations, casein (galalith), amber, shellac or copal, and synthetic resin.

Rate of duty: (See note).

Equivalent ad valorem (1939): 63% (ranging from 20% to 104%).

NOTE.—Plastics products are variously provided for in the Tariff Act of 1930 at the rates shown in the following incomplete list:

Articles of cellulose acetate.....	80% ad valorem.
Articles of cellulose compound other than cellulose acetate.....	60% ad valorem.
Articles of casein (galalith).....	40¢ per lb. plus 50% ad valorem.
Articles of amber.....	20% ad valorem.
Articles of shellac or copal.....	30% ad valorem.
Articles in which synthetic resin is chief binding agent.....	50¢ per lb. plus 40% ad valorem.
Articles of synthetic resin.....	20% ad valorem.

The duty on cellulose acetate articles was reduced to 40 percent ad valorem, effective June 15, 1936, pursuant to agreement with France, and the duty on certain articles of cellulose compounds other than cellulose acetate was reduced to 50 percent ad valorem, effective January 1, 1939, pursuant to trade agreement with the United Kingdom.

GENERAL

Data for United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	65,112	811	64,301	1,700	66,000	Percent
Persons employed (number).....	16,600					1

¹ Estimated landed value; foreign value is \$437,000.

The foregoing statistics and the following statement relate to products composed wholly or in part of plastics materials, such as celluloid or bakelite, which are described and provided for in the tariff law according to the kinds of plastics of which they are made but which are not usually described by name or use. This report does not include plastics products such as plastics paints, photographic film, brushes, toys, combs, costume jewelry, fountain pens, mechanical pencils, ash trays, phonograph records, or articles made of synthetic fibers.

About 85 percent of these articles consumed in the United States consisted of plastic parts for use as components in products of various other industries. Examples of these are: Cases for radios, fans, and for musical instruments; sockets, plugs, insulation, and other electrical fittings; handles for cutlery and for small arms; gears, bearings, and other mechanical parts; panels, trims, and other construction parts; and parts for automobiles and aircraft. The remaining 15 percent of the consumption has consisted of finished consumers' goods such as trays, compacts, dustpans, and tableware.

In the United States, production has about equaled consumption; imports and exports have been relatively small. The value of the domestic output increased from 23 million dollars in 1933 to 65 million dollars in 1939 and this pre-war progress suggests further expansion in the post-war period when the manufacture of peacetime products is resumed. Domestic production has further increased since 1939. Trade estimates indicate that in 1943 the value of output was at least 325 million dollars, or five times the value in 1939 and the quantity of output was about four times that of 1939.

Imports have been insignificant, not because of duties but because the principal expansion of the industry has been in making parts that are used in making other products. Such parts have not been, and probably will not be, imported to any considerable extent for the reason that a large proportion are custom-made. This requires preliminary tests of materials and equipment, and even conferences between the customer and producer. In addition, frequent changes are made in design and materials.

In 1939 imports of the plastics products considered here, were valued at \$437,422; of this total, the value of imports of synthetic resin products represented only about 3 percent, or \$15,158. Most of the remainder in that and earlier years were articles of celluloid and were, for the most part, finished consumers' goods.

POST-WAR SHORT TERM

The value of production in the short term will probably be about five times that of the immediate pre-war years. This forecast is based on the likelihood that the full capacity of the domestic industry will be utilized; that the bulk of the output will consist chiefly of peacetime products; that these products, therefore, will be made of lower cost plastics than those used during the war; and that the downward trend in costs of plastics materials, which began in 1942, will continue for several years in the post-war period.

It is likely that in the short term nearly all the consumption will be supplied from domestic sources. There will be a large accumulated demand for ordinary industrial parts and civilian plastics products, the supply of which has been curtailed since the beginning of the war. In the short term the domestic industry probably will concentrate on supplying this backlog of demand; in the long term it will continue the manufacture of these articles and will introduce new products based on wartime improvements in materials and technique. It is unlikely that plastics parts will be imported.

POST-WAR LONG TERM**Consumption, Production, and Imports**

The substantial increase in domestic production and consumption of peacetime products, an increase in evidence before the war and interrupted by the war, should be resumed and continue into the fifties. The value of production in this country will probably be nearer the level of 1943 than that of 1939.

This estimate is based chiefly on the likelihood that consumption will be supplied very largely by the domestic industry. The forecast that the imports in the long term will continue to be very small in relation to consumption is based chiefly on the assumptions that it will be impracticable to import substantial quantities of parts, and that imports of finished consumers' goods will continue to form a relatively small part of the total consumption of plastics products. If new trends should develop in the future that would be contrary to this assumption, the estimates given below would be subject to change.

Per capita income at 1939 level.

Because of the backlog of demand for peacetime plastics products that will probably not have been fully satisfied in the short term and because of the gain in population, the value of consumption in the long term should be in the neighborhood of 300 million dollars. This amount would be less than the value of consumption in 1943 because the costs of plastics materials will probably be less than in that year.

Duty as in 1939.—With the same duty as in 1939, the foreign value of imports should be about 1.7 million dollars and the landed value would be about 3 million dollars, or about 1 percent of domestic consumption. The value of production for the domestic market would account for about 297 million dollars.

Duty reduced by 50 percent.—As stated above, the present duties on finished consumers' goods made of cellulose plastics not specifically mentioned in the tariff act, which constitute the great bulk of imports, are 40 and 60 percent ad valorem. The foreign value of imports of

such goods might rise to about 3 million dollars and the landed value to more than 4 million dollars, or slightly more than 1 percent of domestic consumption. In this event, the value of production for the domestic market would amount to about 296 million dollars.

Duty increased by 50 percent.—It is probable, under this change in duty, that imports of the cheaper articles would cease and that for this reason total imports would be less than if no change were made in the duty. The foreign value of imports might be about 1 million dollars (landed cost about 2 million dollars) or less than 1 percent of domestic consumption, and the value of production for the domestic market would thus be about 298 million dollars.

Per capita income 75 percent higher than in 1939.

Plastics parts enter into the products of so many industries in this country that a 75-percent increase in per capita income might result in an increase in the consumption of at least 75 percent over the estimated consumption in the long term with national income at the 1939 level, or in the neighborhood of 525 million dollars. Prices of these articles will probably follow rather closely the upward movement of commodity prices. It is likely that the ratios of domestic production and imports to consumption would be about the same as at the lower income level.

Duty as in 1939.—The foreign value of imports might be about 3 million dollars and the landed value in the United States about 5 million dollars, or slightly less than 1 percent of domestic consumption. The value of production for the domestic market would thus be about 520 million dollars.

Duty reduced by 50 percent.—Imports would increase somewhat and have a foreign value of, say, 5 million dollars, and a landed value of about 6.7 million dollars, or slightly above 1 percent of domestic consumption. The value of production for the domestic market would then be about 518.3 million dollars.

Duty increased by 50 percent.—Imports might have a foreign value of about 2 million dollars (over 4 million dollars landed value), or less than 1 percent of domestic consumption. Domestic production would then be about 521 million dollars.

Exports

Because of the accumulated demand in foreign countries, it seems likely that in the immediate post-war years, exports of plastics products should be nearly four times the exports of 1939 with a value of about 3 million dollars. Later the value of our exports may decline to about \$900,000, or a figure about 10 percent above the value in 1939. Post-war exports of plastics products will probably consist largely of articles for use of the ultimate consumer. These articles are likely to go principally to Canada and other Western Hemisphere countries which were the principal pre-war markets. Except as parts of United States machinery sold abroad it is unlikely that plastics parts will be exported.

Employment

The number of workers in the domestic industry was 16,600 in 1939, and nearly twice that figure in 1943. It is probable that the total number employed in the post-war long-term period will approximate 30,000 under the lower assumed income level and 40,000 under the higher.

ROTENONE-BEARING ROOTS

Tariff paragraph	Commodity	Rate of duty
	Cubé (timbo or barbasco) root and derris (tuba or tube) root:	
35	Advanced in value.....	10% ad val.
1722	Crude.....	Free.

NOTE.—The duty of 10 percent ad valorem on cubé and derris root, advanced in value, as provided for in the Tariff Act of 1930, was reduced to 5 percent ad valorem, pursuant to the trade agreements with Venezuela and Peru, effective December 16, 1939, and July 29, 1942, respectively.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	5,909
Value (\$1,000).....	1,614
Unit value (per pound).....	\$0.104

¹ Foreign value.

Cubé and derris roots are the principal rotenone-bearing roots and are used chiefly in the manufacture of agricultural insecticides. They are particularly desirable for use on plants consumed as food, because unlike most other insecticides, they are ordinarily nontoxic to human beings and domestic animals. Rotenone-bearing roots usually contain about 5 percent rotenone, the active ingredient. The roots are prepared for use either by grinding to a dust and mixing with a carrier, or by extracting the rotenone with solvents for use in insecticides of the spray type.

There is no commercial production of rotenone-bearing roots in the United States. United States imports of cubé have come principally from Peru and Brazil, and of derris from British Malaya and the Netherlands Indies. Before 1939 about half of the United States imports of these roots were advanced in value by grinding. Since 1939 the bulk of the imports have been in the crude form.

In the post-war period, the new and potent synthetic insecticide D. D. T.¹ will be competitive with rotenone for use against certain insects. D. D. T. will likely be used in various combinations with rotenone. Rotenone is also competitive in some of its uses with pyrethrum, another important natural insecticide, made from imported pyrethrum flowers, and with inorganic insecticides such as Bordeaux mixture, cryolite, and others. Synthetic organic alkyl compounds produced in the United States will also offer some competition to rotenone.

POST-WAR SHORT TERM

Total increased consumption of insecticides may result in a small increase in the consumption of rotenone-bearing roots over the 1939 level.

POST-WAR LONG TERM

Consumption, Production, and Imports

Consumption of insecticides in the United States will probably increase considerably after the war. Consumption of rotenone will also be likely to increase despite the competition of the newly devel-

¹ Dichlorodiphenyltrichloroethane.

oped synthetics. Imports of rotenone may increase proportionately.

A decrease or increase of 50 percent in the rate of duty on rotenone-bearing roots advanced in value would probably have no pronounced effect upon the total quantities imported. Since 1939, most imports of rotenone-bearing roots have been crude and free of duty.

Per capita income at 1939 level.

Imports of rotenone-bearing roots are likely to increase about 50 percent over those in 1939, or to about 9 million pounds annually. The foreign value of this quantity at 1939 prices would amount to about \$950,000.

Per capita income 75 percent higher than in 1939.

Consumption and imports of rotenone-bearing roots might increase to about 85 percent over the 1939 level, or to about 11 million pounds, with a foreign value of about 1.3 million dollars at 11.8 cents per pound.

PYRETHRUM FLOWERS

Tariff paragraph	Commodity	Rate of duty
35	Pyrethrum flowers: Advanced in value	10% ad val.
1602	Crude	Free.

NOTE.—The Tariff Act of 1930 provided a rate of 10 percent ad valorem on pyrethrum flowers advanced in value. This rate was reduced to 5 percent ad valorem pursuant to the trade agreement with Peru, effective July 29, 1942.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds)	13,570
Value (\$1,000)	1 3,174
Unit value (per pound)	\$0.234

¹ Foreign value.

Dried pyrethrum flowers, which are nonpoisonous to human beings, are used as a raw material for the manufacture of organic insecticides, particularly for household use. Wartime developments and discoveries have resulted in new organic insecticides and improvements in the use of certain pre-war insecticides. Among these improvements are certain fortifiers, which, when added to pyrethrum, strengthen it and make it go farther. In the post-war period, the new and potent synthetic insecticide D. D. T.¹ will be competitive with pyrethrum for use against certain insects. D. D. T. will not entirely displace pyrethrum, since the two are likely to be used together in various combinations. In some of its uses as a garden insecticide, pyrethrum is also competitive with rotenone, another important natural insecticide made from imported cubé and similar roots, and with inorganic insecticides such as Bordeaux mixture and cryolite. Synthetic organic alkyl compounds produced in the United States are directly competitive with pyrethrum, particularly as a household insecticide. Newly developed insect repellents such as dimethylphthalate are also, to some extent, indirectly competitive with pyrethrum.

In recent years there has been no commercial production of pyrethrum flowers in the United States, although experimental cultivation is being carried out in several areas.

¹ Dichlorodiphenyltrichloroethane.

In 1939, over 99 percent of the imports were crude pyrethrum flowers (free of duty), and less than 1 percent were processed and dutiable. Before 1940, imports of pyrethrum flowers came principally from Japan. Since 1940, British East Africa has been the principal source for crude pyrethrum flowers.

POST-WAR SHORT TERM

Increased consumption of all insecticides may result in a small increase in the consumption of pyrethrum over the 1939 level.

POST-WAR LONG TERM

Consumption, Production, and Imports

United States post-war consumption of insecticides will probably increase considerably; accordingly, consumption of pyrethrum might increase, despite the effect of recently developed fortifiers and other improved insecticides. Imports of pyrethrum will be in proportion to increased use.

A decrease or increase of 50 percent in the rate of duty on the flowers advanced in value would have practically no effect upon the total quantities of crude flowers imported. Most of the imports are of the crude flowers which are free; a 50-percent reduction in the rate of duty on flowers advanced in value might bring about some slight decrease in imports of the crude flowers and a slight increase in imports of those advanced in value.

Per capita income at 1939 level with or without duty change.

With a population increase of about 10 percent, United States annual consumption of pyrethrum is likely to increase at least 10 percent over 1939 level, or to about 15 million pounds. At 23 cents per pound, these imports would have a foreign value of about 3.5 million dollars.

Per capita income 75 percent higher than in 1939.

The annual consumption of pyrethrum may possibly increase from 20 to 50 percent over the 1939 levels, or to about 18 million pounds. At 27 cents a pound, these imports would have a foreign value of about 4.9 million dollars.

ALOES

Tariff paragraph	Commodity	Rate of duty
	Aloes:	
35	Advanced in value.....	10% ad val.
1602	Crude.....	Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	865
Value (\$1,000).....	1 232
Unit value (per pound).....	\$0. 268

¹ Foreign value.

The crude aloes of commerce are evaporated from the juice of the leaves of several species of the aloe plant. They are used mainly for the production of aloin, which, in turn, is used chiefly in the manufacture of laxative preparations, particularly in proprietary medicines.

There is no domestic production of crude aloes in the United States, and imports are free of duty. Imports of aloes advanced in value by grinding, which are dutiable at 10 percent ad valorem, are negligible.

Most of the United States imports of aloes have come from the Netherlands West Indies with less important quantities from the Union of South Africa and Venezuela.

United States imports of aloes seem to indicate that consumption has declined during the last 20 years. This decline was probably due to an increase in the price of crude aloes, and the shifting to other laxative materials that were cheaper.

POST-WAR SHORT TERM

During the first few years after the war, consumption of aloes will probably remain at about the 1939 level.

POST-WAR LONG TERM

Consumption and Imports

Owing to an increase in population, consumption of aloes will probably increase slightly, provided prices remain at about pre-war levels.

An increase or decrease of 50 percent in the rate of duty on aloes advanced in value will probably have no effect upon future quantities of aloes imported.

Per capita income at 1939 level.

Imports of aloes might possibly amount to about 950,000 pounds annually, or 10 percent above the 1939 level, with a foreign value of about \$255,000 at 1939 prices.

Per capita income 75 percent higher than in 1939.

Consumption of aloes might possibly increase 25 percent above the 1939 level and amount to about 1.1 million pounds annually, with a foreign value of about \$330,000, at 30 cents a pound.

COCA LEAVES

Tariff paragraph: 36.

Commodity: Coca leaves.

Rate of duty: 5¢ per lb.

Equivalent ad valorem (1939): 53.6%.

NOTE.—The duty of 10 cents per pound, the rate fixed in the Tariff Act of 1930, was reduced to 5 cents per pound, effective July 29, 1942, pursuant to the trade agreement with Peru. An internal revenue tax of 1 cent per ounce is imposed in addition to the duty on imported coca leaves which have not been decocainized.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	590
Value (\$1,000).....	1 110
Unit value (per pound).....	\$0. 19

1 Foreign value.

Coca leaves, a crude drug, are the source of the narcotic cocaine and of a nonnarcotic extract used in the manufacture of cola-type soft drinks. All imports into the United States are under the control of the Bureau of Narcotics.

Coca leaves are not produced in the United States. The shrub from which the leaves are gathered and dried is cultivated in Peru, Bolivia, and the Netherlands Indies. The Netherlands Indies product is higher in recoverable cocaine content, but the Peruvian product seems to be preferred for the production of coca-leaf extract. Peru has been the chief source of imports into the United States.

Consumption of coca leaves doubled between 1936 and 1940 as a result of the growing consumption of cola-type soft drinks. The trend toward increased consumption and also of imports of coca leaves may be expected to continue after the war irrespective of a 50 percent decrease or increase in the duty.

POST-WAR SHORT TERM

Imports of coca leaves will probably be considerably higher than in 1939, owing primarily to increased production of the flavoring extract for cola-type soft drinks. Most of the increased imports will be supplied by Peru.

POST-WAR LONG TERM

Per capita income at 1939 level.

Imports of coca leaves will probably be about 30 percent greater than those in 1939, or about 770,000 pounds, with a foreign value of about \$146,000 at 1939 prices.

Per capita income 75 percent higher than in 1939.

Imports of coca leaves will probably be about double those in 1939, or about 1.2 million pounds, with a foreign value of about \$250,000.

VEGETABLE TANNING MATERIALS AND EXTRACTS

<i>Tariff paragraph</i>	<i>Commodity</i>	<i>Rate of duty</i>	<i>Equivalent ad valorem (1939)</i>
1670	Tanning materials, whether crude or advanced in value or condition by shredding, grinding, or any similar process, of vegetable origin, not containing alcohol.	Free	-----
38	Extracts of the above tanning materials, not containing alcohol.	7½% to 15½%	14% (avg.)
1609	Gambier, prepared or unprepared; and extracts thereof, not containing alcohol.	Free	-----

NOTE.—The rate fixed by the Tariff Act of 1930 on extracts was 15 percent ad valorem. The rate was reduced on myrobalan and mangrove to 10 percent and 7½ percent, respectively, effective January 1, 1939; on valonia to 7½ percent, effective May 5, 1938, and on quebracho to 7½ percent, effective November 15, 1941, pursuant to the trade agreements with the United Kingdom, Turkey, and Argentina, respectively.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports ¹	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	6,500	1,600	4,800	10,200	12,800	Percent 85

¹ Less reexports.

² Estimated.

³ Imports in 1939 were about 25 percent above the level of 1936-38; it is believed that this excess went into inventory and therefore it has not been included in consumption in 1939 or considered in arriving at the ratio of imports to consumption.

⁴ Landed value; foreign value was \$7,958,000.

Vegetable tanning materials and extracts contain, among other elements, a group of related chemical substances known as tannins. These combine with the protein in hides and skins to produce leather. Vegetable tannins are used almost exclusively in producing heavy leathers such as sole and belting; other materials, principally chromium salts, are the chief tanning agents used in making lighter leathers such as shoe upper, shoe lining, glove, and garment leathers.

The chief vegetable tanning materials and extracts used in the United States are quebracho and chestnut, which together account for approximately 80 percent of total consumption. Wattle ranks next in importance, supplying about 10 percent of the total. Other kinds consumed in important quantities are mangrove, myrobalan, valonia, gambier, divi-divi, and sumac. All these tanning agents are used generally in the form of extracts blended to produce the desired quality of leather. Although the proportions of the various kinds used by individual tanners may differ somewhat, quebracho and chestnut always form a large part of the formula. Wattle may be used interchangeably to a considerable extent with quebracho and, to a lesser degree, with chestnut.

The imports covered by this statement and the foregoing statistics include vegetable tanning extracts and woods, barks, and other raw materials from which such extracts are derived. The figures for domestic production cover extracts derived from domestic material but not those derived from imported wood and bark. The production of extract from imported materials is for the most part conducted by a few plants distinct from those which process materials of domestic origin. Imports of wood and bark in 1939 represented only about 25 percent by value of the total imports of the materials and extracts. Imports of the wood and bark have fallen off sharply during the war, and it is probable that they will not regain their former importance in the post-war period. Even before the war extract plants were being built in areas from which some of the raw materials were being imported, and the largest of the domestic plants which had processed imported material has recently been dismantled. The fact that imports of the materials have been duty-free and those of the extracts dutiable apparently has had little bearing on the form of imports, and it seems unlikely that any of the levels of duty to be considered in response to Senate Resolution 341 would materially affect the situation.

Domestic production of vegetable tanning agents consists almost entirely of chestnut extract. Despite predictions for many years of the impending exhaustion of chestnut wood, from which chestnut extract is made, output did not decline until the war created a shortage of manpower and of truck tires. Because of a blight which has affected chestnut trees in the United States and is not yet under control, exhaustion of the supply of the wood may be expected in perhaps 20 or 30 years. United States production of vegetable tanning materials and extracts is insufficient, both in quantity and variety, to meet domestic requirements; they supply only about one-third of consumption. The remainder, which must be imported, consists principally of quebracho wood and extract (70 percent of imports), mangrove bark and extract (10 percent), and wattle bark and extract (slightly more than 10 percent). Quebracho is imported chiefly from Argentina but also from Paraguay; mangrove, chiefly from British East Africa, but also from Malaysia, Colombia, South Africa, and Haiti; and wattle, from South Africa and British East Africa.

Production and prices of quebracho and wattle, which account for the greater part of the supply of imported vegetable tanning materials and extracts, are controlled by a few companies. Through a joint government agreement between Argentina and Paraguay, production of quebracho is restricted and exports closely supervised. Exports and prices of wattle bark and extract are controlled, to a large extent, by an association of producers and exporters in South Africa.

The volume of vegetable tanning materials and extracts consumed in the United States depends almost entirely on the production of sole and belting leather, the trend of which will probably be about the same as that of the production of all leathers. For that reason estimates of the volume of consumption, production, and imports in the post-war period are based on estimates of the volume of leather produced in that period (see section on leather). Because of the concentration of control in the quebracho and wattle industries, and the possibility of competition from synthetic tannins should prices of natural tannins increase beyond a reasonable level, prices will probably not fluctuate to a greater degree than the general level of prices.

POST-WAR SHORT TERM

Based on the estimated production of leather in the post-war short term, consumption of vegetable tanning materials and extracts probably will be substantially above the 1939 level. Domestic production might also be substantially above this level. Inasmuch as imports in 1939 were about 25 percent above the 1936-38 average, imports in the immediate post-war period might amount to no more than those in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Vegetable tanning extracts are used in almost constant proportions. Chestnut extract is practically the only kind produced in the United States and its production is limited. Thus, demand for imported extracts is quite inelastic, and domestic production and imports probably will supply in the future, as in 1939, about one-third and two-thirds of consumption, respectively. A 50-percent decrease or

increase in rates of duty (ranging in 1939 from 7½ to 15 percent), under either assumption of national income, would probably have little effect on consumption, production, or imports, because the kinds imported are not produced domestically and are essential for the production of heavy leathers.

Per capita income at 1939 level.

Consumption of vegetable tanning materials and extracts might be about 10 percent above that in 1939, amounting to about 14 million dollars at 1939 prices. Of this total, production for the domestic market would probably account for about 5 million dollars and imports for about 9 million (landed value). The foreign value of these imports would amount to about 7 million dollars.

Per capita income 75 percent higher than in 1939.

At this income level the quantity of consumption might increase about 30 percent over that in 1939; the value at prices 10–15 percent higher than those in 1939, might amount to about 19 million dollars. Of this total, production for the domestic market might amount to approximately 6 million dollars and imports to 13 million (landed value). The foreign value of imports would be about 10 million dollars.

Exports

United States exports of vegetable tanning extracts have been rather constant, amounting to about 1½ million dollars annually. In the post-war period they might remain approximately at this level, perhaps increasing somewhat if the general level of United States and world income should be substantially higher than in 1939. Exports consist almost entirely of chestnut extract, needed to supplement other extracts in certain important leather-producing countries, such as the United Kingdom, Canada, the Netherlands, Australia, South Africa, and Mexico.

EDIBLE GELATIN

Tariff paragraph: 41.

Commodity: Edible gelatin.

Rate of duty: From 12% ad val. plus 2½¢ per lb. to 20% ad val. plus 7¢ per lb. *Equivalent ad valorem (1939):* From 23% to 28%.

NOTE.—The duty fixed by the Tariff Act of 1930 on edible gelatin valued at less than 40 cents per pound was 20 percent ad valorem plus 5 cents per pound. That rate was reduced to 12 percent ad valorem plus 5 cents per pound, effective April 15, 1931, under section 336 of the tariff act. The rate was further reduced to 12 percent ad valorem plus 2½ cents per pound, effective February 1, 1936, pursuant to the trade agreement with the Netherlands.

GENERAL

Data for United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	125.2	0.4	24.8	2.7	27.5	Percent 10
Value (\$1,000).....	9,473	192	9,281	1,948		
Value (per pound).....	\$0.38	\$0.53	\$0.37	\$0.35		
Persons employed (number).....	1,300					

¹ Partially estimated.
² Foreign value.

Imports of gelatin are classified for duty purposes as edible and inedible. Before 1933, the edible classification included only that which was sold for edible purposes. Following a ruling of the Court of Customs and Patent Appeals in 1933, photographic gelatin—which was not specifically provided for in the Act and had been classified previously as inedible—was reclassified as edible. Since 1935, imports of edible gelatin (including photographic) have represented at least 97 percent, both by quantity and value, of the total imports of gelatin. Exports are relatively unimportant.

Of the gelatin which is produced and sold for edible purposes (hereafter referred to as food gelatin), nearly 60 percent is consumed in the form of jelly powders; approximately 35 percent in the manufacture of ice cream, candy, and biscuits (cookies); and the small remainder in meat packing, dairy products, and other miscellaneous uses. Photographic gelatin, the price of which is about double that of ordinary edible gelatin, is used in the manufacture of photographic plates, film, and paper. The consumption of food gelatin is affected by an increase in population and, up to a point, by an increase in per capita national income. At a very high income level, consumption of gelatin desserts may drop off in favor of more expensive ones. The consumption of photographic gelatin varies in response to changes in national income, since the demand for negative and positive materials for both amateur and commercial use tends to increase as spending power rises.

Imports of food gelatin have come principally from Belgium, the Netherlands, and France; and those of photographic gelatin, almost exclusively from Germany. Although there has been an upward trend in the ratio of imports to consumption during the 10 years preceding the outbreak of the war in 1939, it is doubtful whether imports will play as important a part in the future as they have in the past because the domestic industry as a whole has strengthened itself appreciably since the outbreak of the war. Some producers who previously used imported ossein as a raw material have erected their own ossein plants; and producers of photographic gelatin have met the greatly expanded wartime requirements so successfully that it is doubtful whether this type of gelatin will again be imported in any large quantity.

POST-WAR SHORT TERM

It is probable that consumption of both food and photographic gelatin may be somewhat greater than in 1939. Imports are likely to be less and United States production greater than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—Consumption might be in the neighborhood of 31 million pounds, of which perhaps 27 million pounds would be food gelatin and 4 million pounds photographic. Assuming that imports of photographic gelatin will be small, imports would consist almost exclusively of food gelatin and might range from 1.25–1.75 million pounds, or 4–5 percent of consumption, and from 45–65 percent of

the total quantity of food and photographic gelatin imported in 1939. With imports valued at 25 cents per pound, their foreign value might be \$310,000-\$440,000, or 35-45 percent of the value of imports in 1939. Production for the domestic market would be about 29.5 million pounds, valued at about 11.8 million dollars, at 40 cents per pound.

Duty decreased by 50 percent.—Because of the strengthened position of the domestic industry, probably a 50-percent decrease in duty would not increase imports by more than 15-25 percent. Imports of food gelatin might be 1.4-2.0 million pounds, or 4.5-6.5 percent of consumption and 50-75 percent of the quantity imported in 1939. The foreign value of imports might be within the range of \$350,000-\$500,000, at 25 cents per pound, or 35-50 percent of the 1939 value of imports. Production for the domestic market would be about 29 million pounds, valued at about 11.6 million dollars, at 40 cents per pound.

Duty increased by 50 percent.—Imports of food gelatine might decline sharply to 0.5-1.0 million pounds, or 1.6-3.2 percent of consumption, and 20-40 percent of the quantity imported in 1939. The foreign value of imports, therefore, might be within the range of \$125,000-\$250,000, at 25 cents per pound. Production for the domestic market would be about 30 million pounds, valued at about 12 million dollars, at 40 cent per pound.

Per capita income 75 percent higher than in 1939.

If the per capita national income were 75 percent higher than in 1939, it is probable that the consumption of food gelatin might be only slightly more but that the consumption of photographic gelatin might be approximately 100 percent greater, than if the income were at the 1939 level. Applying these estimates, it is probable that consumption might be in the neighborhood of 35.5 million pounds, of which about 27.5 million pounds might be consumed for edible purposes and about 8 million pounds for photographic uses.

Duty as in 1939.—Imports probably would consist almost exclusively of food gelatin and would be within the range of 1.4-2.0 million pounds or 4-6 percent of consumption and from 50-75 percent of the quantity imported in 1939. The foreign value of imports might be \$392,000-\$560,000, at 28 cents per pound. Production for the domestic market might be about 34 million pounds, valued at about 15.3 million dollars, at 45 cents a pound.

Duty decreased by 50 percent.—It is probable that imports might be about 15 percent greater than they would be if the duty were not changed, and might total 1.6-2.3 million pounds, or 60-85 percent of imports in 1939, and 4.5-6.5 percent of consumption. The foreign value of imports might be within the range of \$448,000-\$644,000, at 28 cents per pound. Production for the domestic market might be about 33.5 million pounds, with a value of about 15.1 million dollars, at 45 cents a pound.

Duty increased by 50 percent.—The volume of imports might be 0.75-1.25 million pounds, or 25-45 percent of the quantity imported in 1939 and 2-3.5 percent of consumption. The foreign value of imports might be \$210,000-\$350,000, at 28 cents per pound. Production for the domestic market might be about 34.5 million pounds, with a value of 15.5 million dollars, at 45 cents a pound.

Exports

For over a decade before the war, United States exports of food gelatin have ranged from 250,000 to 500,000 pounds per year, and have represented from 1 to 2 percent of annual production. There have been no exports of photographic gelatin. Although exports of food gelatin may increase somewhat after the war, it is doubtful whether they will greatly exceed 1 million pounds per year, and they may be much less.

Employment

Before the outbreak of the war in 1939, approximately 1,300 factory wage earners were employed in the production of edible gelatin (including photographic). In the post-war period, under the different assumed income levels, the number of factory wage earners might be as high as 1,600.

HIDE AND EXTRACTED BONE GLUES

Tariff paragraph: 41.

Commodity: Hide and extracted bone glues.

Rate of duty: 20% ad valorem plus *Equivalent ad valorem* (1939): 49%.
2½¢ per lb.

NOTE.—The rate fixed in the Tariff Act of 1930 was 25 percent ad valorem plus 2 cents per pound. The rate was changed to 20 percent plus 2½ cents, effective September 18, 1932, by Presidential proclamation under section 336 of the tariff act.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	64.0	1.4	62.6	1.5	64.1	Percent 2.3
Value (\$1,000).....	8,129	262	7,867	134		
Unit value (per pound).....	\$0.127	\$0.187	\$0.126	\$0.087		
Persons employed (number).....	1,500					

¹ Foreign value.

² Estimated.

Hide and extracted bone glues are made from the skins and bones of animals, especially those of the bovine species. They are used principally in the manufacture of furniture, surface-coated abrasives, matches, printer's rollers, gummed tape, and paper products.

The family of glues includes green bone glue, vegetable glues, fish glue, casein glue, and synthetic resin glues, as well as hide and extracted bone glues. In general, each glue has a more or less distinct market although some uses overlap. Hide and extracted bone glues come into some competition with green bone glue in the manufacture of gummed paper products; and hide glue is meeting increasing competition from synthetic resin glue in the production of high-grade furniture and surface-coated abrasives.

Because of the nature of their principal uses, the consumption of hide and extracted bone glues shows considerable response to fluctuations in the national income.

The ratio of imports to apparent consumption was only 2.3 percent in 1939, an unusually low ratio. The average ratio for the period 1934-39, or 4.5 percent, may be considered more representative of the late pre-war years.

Imports have come principally from Germany, Yugoslavia, the United Kingdom, and Rumania.

POST-WAR SHORT TERM

Consumption may be considerably greater than in the pre-war era because of deferred consumer demand for articles which require animal glue in their manufacture, and which were subject to wartime restrictions on production. Domestic production probably will be at a high level, compared with that in 1939, in order to satisfy domestic consumption, to replenish depleted stocks, and perhaps to provide for increased exports.

POST-WAR LONG TERM

Consumption, Production, and Imports

Although consumption of hide and extracted bone glues is likely to be greater in the post-war period than in 1939, the degree of increase is likely to be restricted by increased competition from synthetic-resin adhesives, particularly in the manufacture of high-grade and high-priced furniture and surface-coated abrasives.

Per capita income at 1939 level.

Consumption might be in the neighborhood of 70 million pounds, an increase of about 9 percent over the 1939 level.

Duty as in 1939.—Imports are likely to be about 4 percent of consumption, or about 3 million pounds (an increase of 100 percent over the 1939 imports but less than the average for 1934-39). At 1939 prices these imports would have a foreign value of about \$260,000. United States production for the domestic market might amount to about 67 million pounds, with a value, at 1939 prices, of about 8.4 million dollars.

Duty reduced by 50 percent.—With the duty reduced to about 25 percent ad valorem, imports might increase to about 14 percent of consumption, or to about 10 million pounds. At 1939 prices, these imports would have a foreign value of \$870,000. United States production for the domestic market might amount to about 60 million pounds with a value, at 1939 prices, of about 7.6 million dollars.

Duty increased by 50 percent.—A duty of about 75 percent ad valorem might reduce imports to about 1 percent of consumption, or to about 700,000 pounds (about half of imports in 1939). At 1939 prices these imports would have a foreign value of \$61,000. United States production for the domestic market might be about 69 million pounds with a value, at 1939 prices, of 8.7 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption might be in the neighborhood of 85 million pounds, or between 30 and 35 percent greater than it was in 1939. It is

assumed that imports will bear the same ratio to consumption as they would with income at the 1939 level.

Duty as in 1939.—Imports might be about 3.5 million pounds, or about 4 percent of consumption, with a foreign value of \$350,000, at 10 cents per pound. United States production for the domestic market might be about 81.5 million pounds, valued at 11.8 million dollars, at 14.5 cents per pound.

Duty reduced by 50 percent.—Imports might be about 12 million pounds, or about 14 percent of consumption, with a foreign value of 1.2 million dollars, at 10 cents per pound. United States production for the domestic market might be about 73 million pounds, valued at 10.6 million dollars, at 14.5 cents per pound.

Duty increased by 50 percent.—Imports might be about 900,000 pounds, or about 1 percent of consumption, with a foreign value of about \$90,000, at 10 cents per pound. United States production for the domestic market might be about 84 million pounds, with a value of 12.2 million dollars, at 14.5 cents per pound.

Exports

For several years before 1939, United States exports of hide glue and extracted bone glue have averaged less than 1 million pounds per year, and have seldom exceeded 2 percent of production. For 2 or 3 years after the war, it is probable that European glue producers will experience a critical shortage of raw materials, and European countries will export less glue than they did before the war. Because of these conditions, United States exports of glue may be in the neighborhood of 2 million pounds per year for some 2 or 3 years. In the post-war long-term period, however, United States exports are not likely to exceed about 1 million pounds annually.

Employment

Employment in 1939 was about 1,500. Under post-war conditions at the higher assumed income level, the number of persons employed might be in the neighborhood of 1,900.

AGAR-AGAR

Tariff paragraph: 41.

Commodity: Agar-agar.

Rate of duty: 25% ad valorem. *Equivalent ad valorem (1939):* 25%.

GENERAL

Data for United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	13	0	13	497	510	Percent 97
Value (\$1,000).....	18	0	18	1 378		
Unit value (per pound).....	\$1.38		\$1.38	\$0.76		
Persons employed (number).....	10					

¹ Foreign value.

² Estimated.

Agar-agar, known also as Bengal isinglass, Japanese gelatin, or vegetable isinglass, is the commercial name for the dried, bleached, gelatinous extract of several species of *Gelidium*, a seaweed. As it is used principally in pharmaceutical preparations and as a culture medium in bacteriological work, it can be assumed that changes in consumption are more closely related to population growth than to national income.

Although for 20 years before the war imports and apparent consumption have fluctuated widely and probably will continue to do so, they appear to have increased at the rate of approximately 8,000 pounds per year with little regard to the prevailing national income. It should be noted that 1939 was not a representative year because both imports and apparent consumption were lower than average. During the period 1937-39 annual average imports were about 600,000 pounds, and average annual consumption was about 610,000 pounds.

Before the war, imports of agar-agar (almost exclusively from Japan) represented at least 94 percent of domestic consumption, the remainder being supplied by one domestic producer. Since the outbreak of the war, and after imports from Japan ceased in 1942, production was undertaken by three or four other concerns in order to supply essential domestic requirements.

The principal factor affecting domestic consumption of agar-agar in both the post-war short and long terms will be whether imports from Japan are resumed. If imports of agar-agar from Japan should for any reason not be resumed, domestic production might be expected to remain above the pre-war level but consumption would probably be greatly reduced by high prices and substitution of other products in uses other than as a culture medium in bacteriological work, for which use there is no satisfactory substitute.

The statements made below regarding probable consumption assume that imports from Japan will be resumed in about their pre-war competitive position. If this should occur, there seems little likelihood that agar-agar will be produced either in this country or in other countries in large quantities in competition with Japanese production. Domestic concerns which undertook its production during the war would, under these conditions, probably cease producing it.

POST-WAR SHORT TERM

Assuming imports from Japan will be resumed, average consumption for 2 or 3 years following the conclusion of hostilities both in Europe and in the Far East probably will be in the neighborhood of 700,000 pounds per year. Approximately 95 percent of consumption may be imported.

POST-WAR LONG TERM

Changes in the national income, or a decrease or increase in the rate of duty by 50 percent are not likely, in the light of past relationships, to have any significant effect on the volume of consumption. In the post-war long term, the average annual consumption of agar-agar might increase over the average of the period 1937-39 by slightly more than the 10 percent increase of the population and would amount

to about 725,000 pounds. The price may be expected to move with the general level of prices.

Duty as in 1939.—Regardless of the national income, imports may be expected to supply, as before the war, about 95 percent of consumption. In an average year, therefore, they might amount to about 690,000 pounds, with a foreign value of around \$524,000, at 1939 prices, although, for any particular year, they might be appreciably greater or smaller. United States production might be about 35,000 pounds valued at \$48,000 at 1939 prices.

Duty decreased by 50 percent.—Imports might supply the entire domestic consumption, and might average around 725,000 pounds per year, with a foreign value of about \$550,000 at 1939 prices.

Duty increased by 50 percent.—In this case, some of the domestic concerns that undertook production during the present war might continue or resume production. Even if this should happen, imports might still be expected to supply about 85 percent of consumption because of the established consumer preferences for the imported product. In that case, imports might average about 615,000 pounds annually, with a foreign value of approximately \$467,000, at 1939 prices. United States production might be about 110,000 pounds valued at about \$152,000, at 1939 prices.

GLYCERIN

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
42	Glycerin:		
	Crude----	$\frac{1}{10}$ ¢ per lb. ($\frac{1}{10}$ ¢ per lb. from Cuba; free from Philippine Islands).	10%
	Refined..	$1\frac{1}{16}$ ¢ per lb. ($1\frac{1}{16}$ ¢ per lb. from Cuba; free from Philippine Islands).	17%

NOTE.—The rates fixed in the Tariff Act of 1930 were 1 cent per pound on crude, and 2 cents per pound on refined. The duty on Cuban crude, $\frac{1}{10}$ cent under the preferential arrangement, was reduced to $\frac{1}{10}$ cent, effective September 3, 1934, pursuant to the Cuban trade agreement. The general rate on crude was reduced to $\frac{1}{10}$ cent, effective November 15, 1941, pursuant to the agreement with Argentina. The duty on refined was reduced to $1\frac{1}{16}$ cents, effective February 1, 1936, pursuant to the Netherlands agreement, and was further reduced to $1\frac{1}{16}$ cents, effective November 15, 1941, pursuant to the agreement with Argentina.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	Exports	For domestic market			
Quantity (1,000 pounds) ²	138, 030	7, 140	130, 890	9, 109	139, 999	Percent .7
Value (\$1,000).....	³ 13, 803	959	12, 844	⁴ 758		
Unit value (per pound).....	\$0. 10	\$0. 13	\$0. 10	\$0. 08		
Persons employed.....	(⁵)					

¹ Production from domestic crude.

² Converted to 100 percent basis at rate of 80 percent for crude and 96 $\frac{1}{2}$ percent for refined.

³ Estimated.

⁴ Foreign value.

⁵ Probably less than 500.

Glycerin has many uses, being employed in drugs and pharmaceuticals, food, paper, cosmetics, adhesives, textiles, and inks. The most important uses are in industrial explosives (dynamite), synthetic resins and ester gums (used largely in surface coatings), cellophane, and tobacco. Its use as an antifreeze, formerly important, is now largely lost, and in a number of its uses glycerin competes with substitute materials. In most of its uses, however, glycerin is preferred, and in many, no really satisfactory substitute is available.

Glycerin is ordinarily a byproduct in the manufacture of soap or fatty acids, and the output of these commodities is the principal factor governing the production of glycerin. Two other factors, however, also affect the output of glycerin. Certain fats and oils, coconut oil, and other lauric-acid oils in particular, have a higher glycerin content than others, and therefore the type of oil or fat used in the manufacture of soap and fatty acids affects the resulting amount of glycerin. Moreover, the amount of glycerin which is recovered is influenced to some extent by the price of glycerin: when the price is low, some small producers do not bother to recover it, and others recover a smaller percentage than they do when the price is high.

During the present war glycerin has been made from molasses or sugar, and it can be made from petroleum also. These processes, however, would probably not be profitable unless the price of glycerin were higher than that which usually prevails in times of peace.

In the pre-war period, United States production of glycerin increased faster than the output of soap and fatty acids did. This circumstance was due primarily to an increased recovery of glycerin, which in turn was due largely to high glycerin prices. Production of glycerin reached a record height in 1941 and then fell because of the declining use of high glycerin-yielding oils and because of restrictions on the quantity of fats and oils allocated to soap and fatty acids.

In 1939 United States imports of glycerin represented only 7 percent of consumption and came chiefly from Argentina, Cuba, the Philippine Islands, and the Soviet Union. Net imports (imports less exports) have in most years been small, although somewhat larger than those of 1939, and exports in 1939 were somewhat larger than usual. Both consumption and production are influenced to a considerable extent by changes in business conditions and the national income. General industrial activity and the consumption of products such as dynamite and surface coatings, whose manufacture requires glycerin, directly affect the demand for and consumption of glycerin and thus affect the amount produced.

POST-WAR SHORT TERM

After the war, both production and consumption of glycerin are likely to increase possibly almost to the record height reached in 1941. Production of soap and fatty acids will probably be from 15 to 20 percent higher than in 1939 and production and consumption of glycerin will probably increase to about the same degree, with a large demand for glycerin in dynamite, synthetic resins and ester gums, tobacco, and other products tending toward increased glycerin recovery. Imports may be slightly lower than in 1939 because of the time required by foreign countries to resume normal trade.

POST-WAR LONG TERM

Consumption, Production, and Imports

As the duty on glycerin is relatively low, an increase or decrease of 50 percent in the 1939 rates would probably have relatively little effect on the consumption or price of glycerin or on the volume of imports.

Per capita income at 1939 level.

Consumption of glycerin may be at least 10 percent higher than in 1939, or about 155 million pounds.

Duty as in 1939.—Imports would probably rise above the level of 1939, about as much as consumption would, or to 10–11 million pounds, supplying about 7 percent of consumption. At 1939 unit values such imports would have a foreign value of \$800,000–\$900,000. United States production for the domestic market might be about 144–145 million pounds valued at about 14.4–14.5 million dollars (at 1939 prices).

Duty reduced by 50 percent.—Any increase in the volume of imports caused by the reduction in duty would be small, probably not more than 1–2 million pounds. Thus imports would probably be 11–13 million pounds, supplying about 8 percent of consumption, with a foreign value of \$900,000–\$1,050,000, at 1939 prices. United States production for the domestic market might be 142–144 million pounds valued at 14.2–14.4 million dollars (at 1939 prices).

Duty increased by 50 percent.—Any decrease in the volume of imports owing to the increase in duty would be small, probably not more than 1–2 million pounds. Thus imports would probably be 8–10 million pounds, supplying about 6 percent of consumption, with a foreign value of from \$650,000–\$800,000, at 1939 prices. United States production for the domestic market might be 145–147 million pounds, valued at 14.5–14.7 million dollars (at 1939 prices).

Per capita income 75 percent higher than in 1939.

Consumption of glycerin might increase to a minimum of 35 percent over that in 1939 under a 75-percent increase in per capita income. Supplies would come principally from increased production of soap and fatty acids. Consumption might then amount to about 190 million pounds. Imports would supply about the same proportion of domestic consumption as they would under the lower level of national income.

Duty as in 1939.—Imports might increase in the same ratio as consumption under the impetus of a larger United States demand and of higher prices. Imports might then be 11–13 million pounds, with a foreign value of \$1,000,000–\$1,150,000, at a unit value of 9 cents per pound. United States production for the domestic market might be about 177–179 million pounds, with a value of 19.4–19.7 million dollars, at 11 cents per pound.

Duty reduced by 50 percent.—Imports might be 12–15 million pounds, with a foreign value of \$1,100,000–\$1,350,000, at a unit value of 9 cents per pound. United States production for the domestic market might be 175–178 million pounds, with a value of 19.3–19.6 million dollars, at 11 cents per pound.

Duty increased by 50 percent.—Imports might be 9–12 million pounds, with a foreign value of \$800,000–\$1,100,000, at a unit value of 9

cents per pound. United States production for the domestic market might be 178-181 million pounds, with a value of 19.6-19.9 million dollars, at 11 cents per pound.

Exports

Exports of glycerin from the United States have generally been small. They increased materially after 1938 probably because some foreign countries were building up stocks in anticipation of the outbreak of war. They are likely to decline in the future to a level lower than that of 1939 because of increased demand in the United States. Exports might be from 2-4 million pounds annually, valued at about \$250,000-\$500,000.

Employment

Glycerin is produced as a byproduct of the soap and fatty-acid industries, and, except in several of the larger plants, workers spend only a part of their time on glycerin. The total number of men employed in producing glycerin is relatively small, compared with those employed in the production of the main products, and is estimated at 400-500 persons.

CAMPHOR

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
51	Camphor:		
	Crude.....	1¢ per lb.	3.6%
	Refined and synthetic.....	5¢ per lb.	12.4%

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export	For domestic market			
Quantity (1,000 pounds).....	2,500		2,500	2,503	5,003	Percent 50
Value (\$1,000).....	875		875	1,866		
Unit value (per pound).....	\$0.35		\$0.35	\$0.35		
Persons employed (number).....	50-60					

¹ Estimated.
² Foreign value.

Camphor is a crystalline solid, which is available commercially both as a natural product from the camphor tree and as a synthetic product from turpentine. Natural camphor is optically active¹ whereas synthetic camphor is optically inactive; otherwise the properties of these two forms of camphor are about the same. Natural camphor is produced in two grades, crude and refined. Competitive grades of synthetic camphor, technical and U. S. P. (medicinal), are manufactured by producers of the synthetic product.

¹ A substance is optically active if, when polarized light is passed through it, the plane of the polarized light is rotated.

The apparent consumption of camphor in the United States has averaged about 6 million pounds annually over a long period, though varying considerably from year to year. Refined natural and U. S. P. synthetic camphor account for about 20 to 25 percent of the total camphor consumption. More than half of the domestic consumption of camphor is used in the production of nitro cellulose (pyroxylin) plastics. Crude natural or technical synthetic camphor is employed for this purpose. The rest of the domestic consumption of camphor is used in the manufacture of insecticides, pharmaceuticals, and explosives.

United States production of synthetic camphor, which was begun in 1933, supplied about one-half of domestic requirements in 1939. Subsequent to United States entry into the war, domestic productive capacity has been enlarged to supply all domestic requirements. Imports of natural camphor, both crude and refined, have been almost entirely from Japan (Formosa), where the trade is under the control of a Japanese Government monopoly. Formerly imports of synthetic camphor came principally from Germany, where it was produced from American turpentine. Since 1941 imports of all types of camphor have not exceeded 35,000 pounds in any year.

POST-WAR SHORT TERM

United States consumption of camphor will be likely to increase considerably over that in 1939 because of a probable slight increase in the production of nitrocellulose plastics and a much larger consumption of camphor in medicinals and insecticides. The quantity of natural camphor imported will probably be small, as the Japanese industry will most likely be disrupted by the war. Imports of synthetic camphor are expected to be negligible, as Germany was the principal foreign producer. Domestic production, expanded during the war, can more than supply all United States peacetime requirements. Exports will probably be made in moderate quantities to supply former markets of Japanese and German camphor.

POST-WAR LONG TERM

Consumption, Production, and Imports

United States consumption of camphor is determined largely by the production of nitrocellulose (pyroxylin) plastics, which, in recent years, has not increased as the production of other plastic materials has. Production of pyroxylin plastics may be expected to remain about the same as in 1939 at the 1939 level of income, but might increase about 10 percent at the higher income level. Consumption of camphor in the manufacture of insecticides, medicinals, and explosives, on the other hand, will be likely to increase substantially as national income increases. Estimates for post-war consumption are based on the actual average pre-war consumption of 6 million pounds rather than on the calculated apparent consumption of 1939. Because the pyroxylin manufacturers maintained sizable stocks, the actual average figure is more significant. The following estimates are based on the assumption that, as before the war, natural camphor will be available from Formosa and Japan, and that Germany and other European countries will produce synthetic camphor for export.

Per capita income at 1939 level.

Consumption of camphor will probably be about 6½ million pounds. Because of the greatly increased domestic capacity for the production of synthetic camphor from turpentine, which is available in large quantities, there will probably be no imports of the synthetic product.

Duty as in 1939.—Imports of crude natural camphor might be about 1¼ million pounds and imports of refined natural camphor approximately 500,000 pounds, or a total of about 27 percent of domestic consumption. The foreign value of these imports at 1939 prices would be \$350,000 and \$200,000, respectively. Domestic production would be about 4¼ million pounds, with a value of 1.66 million dollars, at 1939 prices.

Duty reduced by 50 percent.—Imports of crude natural camphor would change very slightly at a duty reduction of one-half cent a pound. They might amount to 1.3 million pounds, with a foreign value of \$363,000, at 1939 prices. Refined natural camphor imports at a duty reduction of 2½ cents per pound might amount to about 750,000 pounds, with a foreign value of \$300,000, at 1939 prices. Total camphor imports would be approximately 32 percent of consumption. The domestic output might be slightly less than 4½ million pounds, valued at 1.57 million dollars, assuming 1939 prices.

Duty increased by 50 percent.—Imports of natural crude camphor would probably be about 1.2 million pounds, with a foreign value of \$335,000, at 1939 prices. Imports of refined natural would probably be only about 250,000 pounds, with a foreign value of \$100,000, at 1939 prices. Imports of both crude and refined natural camphor would be about 22 percent of consumption. The domestic production might be slightly more than 5 million pounds, valued at about 1.75 million dollars, assuming 1939 prices.

Per capita income 75 percent higher than in 1939.

Domestic consumption of camphor might be about 7¼ million pounds at this higher level of income. Prices of the various camphors would probably increase about 10 percent above those in 1939. The ratio of imports to consumption under the several duty assumptions will be approximately the same as at the lower level of income.

Duty as in 1939.—Imports of crude natural camphor will probably be about 1.4 million pounds, with a foreign value of \$430,000 at 31 cents per pound and those of refined natural camphor, approximately 700,000 pounds, or about 27 percent of consumption, with a foreign value of about \$310,000, at 44 cents per pound. The domestic output would amount to approximately 5.6 million pounds, with a value of about 2.2 million dollars, at 39 cents per pound.

Duty reduced by 50 percent.—Imports of crude natural camphor would probably amount to 1.5 million pounds, with a foreign value of \$465,000, at 31 cents per pound. Imports of refined would probably be 950,000 pounds, with a foreign value of \$420,000, at 44 cents per pound. Total crude and refined natural camphor imports would be about 32 percent of consumption. Domestic production would be about 5.3 million pounds, with a value of about 2.1 million dollars, at 39 cents per pound.

Duty increased by 50 percent.—Imports of crude camphor might be about 1.3 million pounds, with a foreign value of \$405,000, at 31 cents per pound and imports of refined camphor, about 400,000 pounds,

with a foreign value of about \$175,000, at 44 cents per pound, or a total of about 22 percent of consumption. Domestic production might be about 6 million pounds, with a value of about 2.35 million dollars, at 39 cents per pound.

Exports

Exports of domestic synthetic camphor were negligible in pre-war years. During the immediate post-war period exports may be made in moderate quantities. However, during the post-war long term exports will probably again be very small.

Employment

The number of persons employed in the domestic production of synthetic camphor, estimated to be 50-60 in 1939, might increase to 140-150 if the maximum estimated production were realized in the post-war period.

MENTHOL

Tariff paragraph: 51.

Commodity: Menthol (natural and synthetic).

Rate of duty: 50¢ per lb.

Equivalent ad valorem (1939): 23%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below.

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export	For domestic market			
Quantity (1,000 pounds).....	120		120	407	527	<i>Percent</i> 77
Value (\$1,000).....	300		300	\$ 884		
Unit value (per pound).....	\$2.50		\$2.50	\$2.18		
Persons employed (number).....	² 100					

¹ Estimated.

² Foreign value.

³ Less than 100.

Menthol, both natural and synthetic, is used principally in pharmaceuticals and medicines, tobaccos, dental preparations, liqueurs, and confectionery. Quite recently synthetic menthol has been recognized by the U. S. Pharmacopoeia, and the two types may now be considered almost wholly interchangeable. Natural menthol occurs as colorless crystals or fused masses. It is usually produced from essential oils that are distilled from the Japanese peppermint plant. The United States has produced only minor quantities of natural menthol. Synthetic menthol is made principally from imported citronella oil or from cresol, a coal-tar product. Synthetic menthol production in the United States has increased over the 1939 level, and, owing to recent newly developed processes and lowered production costs, production will probably continue to increase in the future.

Before 1940, Japan was the world's principal source of natural menthol and the principal source for United States supplies. In

1940 China was the most important source of United States imports; in recent years Brazil replaced China. In 1939 the United States imported synthetic menthol chiefly from France and Germany.

POST-WAR SHORT TERM

In the first few years following the war, United States consumption of menthol will probably increase over the level in 1939. United States production of synthetics will probably increase to more than 50 percent of consumption, as Japan will probably not be in a position to export.

POST-WAR LONG TERM

Consumption, Production, and Imports

An increase in the consumption of menthol over that in 1939 will probably result from an increase in population, and possibly, increased consumption of manufactured articles containing menthol. The following estimates are based on the assumption that Japan will resume its pre-war position in world markets.

Per capita income at 1939 level.

United States consumption of menthol will probably be about 10 percent higher than it was in 1939, or about 580,000 pounds, probably depending somewhat on the assumed rate of duty.

Duty as in 1939.—Under the present rate of duty of 50 cents per pound, United States imports might be 60 percent of the menthol consumed. This would amount to about 350,000 pounds annually, with a foreign value of about \$760,000, at 1939 prices. United States production would amount to approximately 40 percent or 230,000 pounds annually, with a value of about \$575,000, at 1939 prices.

Duty reduced by 50 percent.—If the duty on menthol were reduced to 25 cents per pound, imports might constitute about 80 percent of the menthol consumed in the United States. Imports of menthol might amount to about 460,000 pounds annually, with a foreign value of about 1 million dollars, at 1939 prices. United States production might be about 20 percent, or 120,000 pounds annually, valued at about \$300,000, assuming 1939 prices.

Duty increased by 50 percent.—With the duty on menthol at 75 cents per pound, imports into the United States might average about 30 percent, or 170,000 pounds annually, with a foreign value, at 1939 prices, of about \$370,000. Domestic production might be about 70 percent of the United States requirements, or about 410,000 pounds annually, which, at 1939 prices, would be valued at 1 million dollars.

Per capita income 75 percent higher than in 1939.

The consumption of menthol might increase a third over that in the 1939 level, or around 700,000 pounds annually, possibly depending somewhat on the assumed rate of duty.

Duty as in 1939.—With a duty of 50 cents per pound, United States imports of menthol might amount to about 420,000 pounds annually, or about 60 percent of the total consumption, with a foreign value, at \$2.50 a pound, of about 1 million dollars. Domestic production of synthetic menthol might be about 40 percent of consumption, or

280,000 pounds annually, and, at \$2.75 a pound, might have a value of about \$770,000.

Duty reduced by 50 percent.—If the duty on menthol were reduced to 25 cents per pound, imports might be expected to supply about 80 percent of the domestic supply, or about 560,000 pounds annually, with a foreign value of 1.4 million dollars at \$2.50 a pound. Domestic production might be about 20 percent of consumption, or 140,000 pounds annually, which, at \$2.75 a pound, would have a value of \$385,000.

Duty increased by 50 percent.—If the duty on menthol were increased to 75 cents a pound, imports might be about 30 percent of consumption, or 210,000 pounds annually, which, at \$2.50 a pound, would have a foreign value of about \$525,000. Domestic production may possibly account for about 70 percent of the menthol consumed in the United States. It would amount to about 490,000 pounds annually, which, at \$2.75 a pound, would have a value of about 1.3 million dollars.

Exports

Exports of menthol have been small and, except for possible increased exports immediately following the war, will probably remain small.

Employment

The total number of factory employees for synthetic menthol production in the United States is probably less than 100. With the highest assumed income, employment will still probably be less than 100.

ESSENTIAL OILS

Tariff paragraphs: 58 and 1731.

Commodity: Essential oils.

Rate of duty: Free—25 percent. *Equivalent ad valorem (1939):* 0% to 25%.

NOTE.—All dutiable essential oils except eucalyptus oil were dutiable under the Tariff Act of 1930 at the rate of 25 percent ad valorem. Pursuant to various trade agreements the tariff on most of the oils subject to the 25-percent rate was reduced to 12½ percent.

GENERAL

Data on United States production, imports, and consumption for 1939 and 1937 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
1939:						<i>Percent</i>
Quantity (1,000 pounds).....	1 8,534	1 789	1 6,745	8,702	15,447	56
Value (\$1,000).....	9,814	2,430	7,384	2 6,444		
Unit value (per pound).....	1 \$1.15	1 \$1.36	1 \$1.09	\$0.74		
Persons employed (number).....	1 300					
1937:						
Quantity (1,000 pounds).....	1 5,139	1 884	1 3,255	7,330	10,585	69
Value (\$1,000).....	5,139	2,139	3,000	2 5,457		
Unit value (per pound).....	1 \$1.00	1 \$1.14	1 \$0.92	\$0.74		

1 Estimated.

2 Foreign value.

Essential oils are volatile aromatic oils obtained from the roots, leaves, flowers, fruit, or wood of plants and used as perfume and flavoring materials and in medicinal preparations. Essential oils consumed in the United States include anise, bergamot, camphor, cassia, citronella, eucalyptus, geranium, lavender, lemon, lemon grass, lignaloe, lime, orange, neroli, pettigrain, peppermint, spearmint, rose, and many others. Since each of the essential oils is valued for its particular flavor or perfume, they compete with each other only in a very general sense.

Most of the essential oils are produced outside the United States. About three-fourths of domestic production is accounted for by orange, lemon, and peppermint oils, distilled from domestic materials; much of the remainder by oils of sandalwood, clove, and patchouli, distilled from imported materials. The value of production reported for 1939 is unusually high; therefore, statistics are given also for 1937, a more representative year.

Imports usually supply up to three-fourths of consumption of essential oils as a group. Most of the individual oils imported have no domestic competition; the most notable exceptions are peppermint, orange, and lemon oils. Each imported oil has its own channels of trade; imports of the group come from every section of the globe. About three-fourths of the oils are imported free of duty.

POST-WAR SHORT TERM

Imports of essential oils may temporarily decrease from those countries where there has been fighting because of damage to the stills and changes in crops. On the other hand imports of certain oils may increase from countries which have accumulated stocks they were unable to ship during the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

In the past, consumption of essential oils has increased with increased national income.

As dutiable essential oils are only a small percentage of total essential oil imports, a change in duty would not have a great effect on total imports. A reduction in duty by 50 percent might reduce domestic production of peppermint oil by 50 percent and increase imports accordingly. Production of oils of orange or lemon might be reduced somewhat but to a lesser extent, as they are produced, along with other byproducts, from cull and surplus fruits.

Per capita income at 1939 level

Consumption might be about 12 million pounds of essential oils, depending somewhat on the assumed rate of duty.

Duty as in 1939.—Imports might supply about two-thirds of consumption, or 8 million pounds, with a foreign value of 5.9 million dollars, at 1939 prices. United States production for the domestic market might be about 4 million pounds of oils, valued at about 4.4 million dollars; exports might be about 2 million pounds, valued at 2.7 million dollars. Both estimates assume 1939 prices.

Duty reduced by 50 percent.—If the duty were decreased, 8.5 million pounds of essential oils, with a foreign value of 6.3 million dollars, at 1939 prices, might be imported. United States production for the domestic market might be about 3.5 million pounds, with a value of 3.8 million dollars, at 1939 prices.

Duty increased by 50 percent.—If the duty were increased, imports of essential oils might be 7.5 million pounds, with a foreign value of 5.6 million dollars, at 1939 prices. United States production for the domestic market might be about 4.5 million pounds, with a value of 4.9 million dollars, at 1939 prices.

Per capita income 75 percent higher than in 1939

Consumption might be about 15 million pounds of essential oils, depending somewhat on the assumed rate of duty.

Duty as in 1939.—Imports might supply about two-thirds of consumption, or 10 million pounds, with a foreign value of 8.5 million dollars, at 85 cents per pound. United States production for the domestic market might be about 5 million pounds, valued at 6 million dollars, at \$1.20 per pound, and exports about 3 million pounds, valued at about 4.5 million dollars, at \$1.50 a pound.

Duty reduced by 50 percent.—If the duty were decreased, 11 million pounds of essential oils with a foreign value of 9.4 million dollars, at 85 cents per pound, might be imported. United States production for the domestic market might be about 4 million pounds, having a value of about 4.8 million dollars, at \$1.20 per pound.

Duty increased by 50 percent.—If the duty were increased, imports of essential oils might be 9 million pounds, with a foreign value of 7.7 million dollars, at 85 cents per pound. United States production for the domestic market might be about 6 million pounds, having a value of about 7.2 million dollars, at \$1.20 per pound.

Exports

United States exports of essential oils include peppermint, lemon, orange, and others. They will probably total 2–3 million pounds, valued at 2.5–4.5 million dollars, depending on the per capita income of the rest of the world.

Employment

Between 300 and 400 persons may be employed in the distilling and refining of essential oils. Many others are employed part time in the growing of the essential oil plants.

CRUDE OPIUM

Tariff paragraph: 59.

Commodity: Crude opium containing 8.5 percent and over of anhydrous morphine.

Rate of duty: \$3 per lb. (plus 16¢ per lb. internal revenue tax). *Equivalent ad valorem (1939):* 77%.

NOTE.—The rate of \$3 per pound, fixed in the Tariff Act of 1930, was reduced to \$18 per pound of anhydrous morphine content, but not less than \$1.80 nor more than \$3 per pound of opium, effective June 28, 1944, pursuant to the trade agreement with Iran.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	181
Value (\$1,000).....	1 708
Unit value (per pound).....	\$3. 92

¹ Foreign value.

Imports were considerably higher in 1939 than the average during 1936-40, which was slightly less than 167,000 pounds, with an average foreign value of \$3.91 per pound.

The importation, manufacture, and use of opium and its derivatives are strictly controlled by the United States Government; they are therefore not determined by market demand in the usual manner. The Government attempts to limit the use of opium to indispensable medical needs. Importation of manufactured derivatives of opium is prohibited by statute.

Crude or raw opium is not produced commercially in the United States and consumption is supplied by imports. Imports of crude opium contain about 14 percent morphine, the most important opium alkaloid. Opium is used for medicinal purposes, and no substitutes equal the effectiveness of opium-derived medicinals in some of their uses. In other therapeutic uses, however, there are reasonably satisfactory substitutes for certain opium derivatives.

Turkey has been the principal source of United States imports; sale of opium from Turkey and Yugoslavia has been under monopoly control since 1934.

POST-WAR SHORT TERM

Because of increased medical requirements resulting from the war, consumption during the first few years following the war will probably be above the 1939 level by about 10 percent.

POST-WAR LONG TERM

Consumption and imports of crude opium are determined by medical needs, and neither the rate of duty nor the level of national income have any material effect upon its use. The increase in population would tend to bring about a moderate increase over consumption in 1939 but the extra requirements of wartime and of the immediate post-war period may gradually decline. It may therefore be expected that consumption will be about 10-20 percent in the post-war long term more than in 1939, or 200,000-220,000 pounds, with a foreign value of 0.8-1.1 million dollars, on the basis of a foreign unit value of \$4-\$5 per pound.

PERFUME MATERIALS

Tariff paragraph: 60.

Commodity: Natural or synthetic aromatic chemicals; all mixtures containing essential or distilled oils or natural or synthetic aromatic chemicals.

Rate of duty: 22½% to 45%; 40¢ lb. plus 30%. *Equivalent ad valorem (1939):* 22½% to 45% (39% weighted average).

NOTE.—Under the Tariff Act of 1930 perfume material mixtures or combinations were dutiable at the rate of 40 cents per pound plus 50 percent ad valorem; the unmixed materials were dutiable at 45 percent ad valorem. The ad valorem portion of the rate on the mixtures was reduced to 30 percent, effective June 15, 1936, pursuant to the trade agreement with France; of the unmixed class, the rate was reduced on geraniol and hydroxycitronellal to 30 percent and 22½ percent, respectively, pursuant to the trade agreement with Switzerland, effective February 15, 1936.

GENERAL

Data on United States production, imports, and consumption for 1939, are given below:

Item	Production			Imports ²
	Total ¹	For export	For domestic market	
Quantity (1,000 pounds).....	2,000	(³)	2,000	308
Value (\$1,000).....	1,420	(³)	1,420	⁴ 1,049
Unit value (per pound).....	\$0.71	(³)	\$0.71	\$3.41
Persons employed (number).....	100			

¹ Estimated.

² Ratio of imports to consumption not given for reasons stated in the text.

³ Negligible.

⁴ Foreign value.

Perfume materials imported under paragraph 60, which are considered here include: (1) unmixed natural or synthetic odoriferous or aromatic chemicals, other than those of coal-tar origin; and (2) mixtures or combinations containing essential or distilled oils or natural or synthetic odoriferous or aromatic chemicals, provided they do not contain more than 10 percent of alcohol and are not marketable as perfumery, cosmetics, or toilet preparations.

The perfumery chemicals include such items as linalyl acetate, geraniol, hydroxycitronellal, ionone, rhodinol, safrol, terpeneol, and others. Imports were principally from France, Germany, and Switzerland and amounted to \$295,000 in value in 1939.

The perfume mixtures are usually semifinished perfumes, which require only the addition of alcohol and to be packaged to produce the final product. Perfume mixtures were imported chiefly from France and chiefly by United States branches of foreign perfumery companies. These imports amounted to \$754,000 in 1939. Overseas shipment as perfume mixtures, rather than as bottled perfumes, reduces duty payments (both because the rate is lower and because it is applied to a lower foreign value) and reduces transportation expenses. As a consequence most "imported perfumes" on our market are imported in this form, diluted to commercial strength and packaged (often in imported bottles and packages) in the United States.

The United States produces substantial amounts of non-coal-tar odoriferous or aromatic chemicals. These domestic perfume chemi-

icals are in part the same as those imported and in part items which are not imported. The United States has an established perfume industry which compounds perfume mixtures to be used in producing its finished products; these mixtures in the United States are not ordinarily, however, an article of commerce.

Under these conditions, with both imports and production statistics including perfume chemicals, but with imports also including perfume mixtures, the usual calculations of apparent consumption and of ratio of imports to consumption have little meaning. The much higher unit value of imports than that of production is largely due to this difference in the type of materials included.

During the present war, production of perfumery chemicals increased considerably. Imports of perfumery chemicals declined to about 40 percent and imports of perfume mixtures to about 60 percent of their values during 1939.

POST-WAR SHORT TERM

United States consumption of non-coal-tar chemicals used in perfumery will probably increase considerably after the war because of increased production of finished perfumes and toilet preparations. Imports of the unmixed aromatic chemicals will likely decline because of increased domestic production of these products, but imports of the mixtures, which have been curtailed during the war years, will probably increase.

POST-WAR LONG TERM

Consumption, Production, and Imports

Consumption of all the perfume materials covered by this report is dependent on the demand for perfumes and toilet preparations and like that demand will be affected by changes in the national income. United States consumption of perfume chemicals, both domestic and imported, is chiefly for the manufacture of domestic perfumes, which in general sell in the lower and medium priced ranges. The consumption of imported perfume mixtures, on the other hand, is for the production of so-called imported perfumes, which generally sell in the higher priced range.

The imports of perfume mixtures and of about half of the imports of perfume chemicals would not be greatly affected by a 50 percent increase or decrease in the duty, since they do not directly compete with domestic products. The remaining imports, however, are identical with and therefore are directly competitive with domestic products.

The values calculated for a national income at the 1939 level assume the same prices as in 1939 and those calculated for a national income 75 percent greater than in 1939 assume an increase of 10 percent in prices.

Per capita income at 1939 level.

Duty as in 1939.—Imports of perfume mixtures are likely to have a foreign value of about \$850,000 and imports of chemicals used in perfumery a foreign value of about \$150,000, a total of about 1 million dollars. United States production is likely to maintain some of its wartime gains and to have a value of about 1.8 million dollars at 1939 prices.

Duty reduced by 50 percent.—Imports of perfume mixtures with a foreign value of about \$850,000 plus imports of perfumery chemicals

with a foreign value of about \$250,000 at this reduced duty are likely to total 1.1 million dollars. United States production might amount to about 1.7 million dollars at 1939 prices.

Duty increased by 50 percent.—Imports of perfume mixtures are likely to have a foreign value of about \$800,000 plus imports of perfumery chemicals with a foreign value of about \$100,000, a total about \$900,000. United States production might be about 1.9 million dollars at 1939 prices.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Imports of perfume mixtures seem likely to have a foreign value of approximately 1.5 million dollars at a price level about 10 percent higher than that of 1939. Imports of perfumery chemicals might have a foreign value of \$300,000 at such a price level; imports would therefore amount to about 1.8 million dollars (foreign value). United States production might have a value of about 2.8 million dollars.

Duty reduced by 50 percent.—Imports of perfume mixtures are likely to have a foreign value of about 1.5 million dollars and imports of perfumery chemicals a value of about \$600,000, which would total about 2.1 million dollars at a price level about 10 percent above that of 1939. United States production might amount to about 2.5 million dollars at such a level.

Duty increased by 50 percent.—Imports of perfume mixtures seem likely to have a foreign value of about 1.4 million dollars and imports of perfumery chemicals a foreign value of about \$200,000, which would total 1.6 million dollars, all at a price level about 10 percent above that of 1939. United States production might have a value of about 3 million dollars at a similar price level.

Exports

Exports of both perfumery chemicals and perfume mixtures are negligible and are not listed separately in official statistics.

Employment

The estimated number of persons engaged in the domestic production of chemicals used in perfumery (now approximately 100 persons) seems likely to increase by 25 percent in the immediate postwar period and in the postwar long term at the higher income level.

PERFUMERY AND TOILET PREPARATIONS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939) (weighted average)
61	Perfumery, toilet preparations, etc.:		
	Containing alcohol.....	40¢ per lb. plus 37½% ad val.	47%
	Not containing alcohol....	25% to 37½% ad val.	37%

NOTE.—The rates fixed in the Tariff Act of 1930 on alcoholic perfumery was 40 cents per lb. plus 75 percent ad valorem; on nonalcoholic perfumery the rate was 75 percent ad valorem. The ad valorem portion of the rate on alcoholic perfumes was reduced to 37½ percent, effective June 15, 1936, pursuant to the trade agreement with France; the rate on nonalcoholic perfumes and perfumed bath salts, was reduced to 37½ percent ad valorem, effective June 15, 1936, and January 1, 1939, pursuant to the trade agreements with France and the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports (foreign value)	Apparent consumption ¹	Ratio of imports to con- sumption ²
	Total	For export	For domestic market			
Value (\$1,000), total.....	187,392	6,823	180,569	547	151,390	<i>Percent</i> 0.5
Perfumes and toilet waters.....	16,365	³ 220	16,145	300	16,730	3.5
Cosmetics and toilet preparations.....	141,027	⁴ 6,603	134,424	157	134,680	.2
Persons employed (number).....	⁴ 15,000					

¹ Including imports at estimated landed values (in \$1,000) as follows: Total, 821; perfumes and toilet waters, 688; and cosmetics and toilet preparations, 236.

² Ratio of estimated landed value to value of apparent consumption.

³ Estimated.

⁴ About 15,000.

The imports dutiable under paragraph 61 include perfumes and a wide range of cosmetics and toilet preparations for application to the hair, mouth, teeth, or skin. The table gives the totals of production and imports and a break-down into perfumes and toilet waters on the one hand and cosmetics and toilet preparations on the other. The figures on value of consumption have been adjusted to include the landed value of imports, and the landed value of imports has been used in determining the ratio of imports to consumption.

The United States has a large cosmetic and toilet preparations industry. Imports are small in comparison with either production or consumption and exports are important.

As shown in the table, imports of perfumes are about 3½ percent of consumption. Production of perfumes, recognized as domestic, is chiefly in the low- and medium-price ranges. So-called imported perfumes sell in the higher priced range. But these categories do not correspond with our statistics given above. The bulk of "imported" perfumes are actually imported as perfume mixtures (see section on perfume materials, par. 60) and then diluted with alcohol, bottled and packaged in the United States. The \$390,000 of imports shown above does not include the bulk of the so-called imported perfumes but only those imported in finished form. On the other hand the 16 million dollars reported as United States production for the domestic market includes not only domestic perfumes but most of the so-called imported perfumes which were imported as perfume mixtures and then prepared for our market in this country.

Consumption of perfumery and cosmetics in the United States has been greatly affected by the national income. Pre-war imports of perfumery and cosmetics were principally from France. The United Kingdom and Germany supplied smaller quantities of these products:

POST-WAR SHORT TERM

Consumption and production of perfumery and toilet preparations are likely to be greater after the war than in 1939. Imports will also probably be greater than in 1939. United States exports are likely to be higher than in pre-war years as exporters will probably retain some of their wartime trade.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

United States consumption and production for the domestic market of perfumery and cosmetics will probably increase about 10 percent in value above that in 1939 or roughly in proportion to the increase in the population of the country. United States production for the domestic market may accordingly be valued at about 166 million dollars. Imports will probably not exceed 1 percent of the value of United States consumption.

Duty as in 1939.—Imports of perfumery and cosmetics might be 10 percent less in value than in 1939, or have a foreign value of about \$500,000, because of the trend of foreign companies to utilize branch houses in the United States and import unfinished blends rather than the finished perfumes.

Duty reduced by 50 percent.—If the rates on perfume mixtures or blends under paragraph 60 were proportionally reduced, imports might have a foreign value of about \$600,000.

Duty increased by 50 percent.—If the duty on perfume mixtures or blends were proportionally increased, imports might have a foreign value of about \$350,000.

Per capita income 75 percent higher than in 1939.

Domestic consumption and production of perfumes would probably increase about 80 percent and cosmetics and toilet preparations about 50 percent above the value in 1939. United States production for the domestic market would probably amount to about 230 million dollars.

Duty as in 1939.—Imports would probably have a foreign value of about \$750,000.

Duty reduced by 50 percent.—If the rates on perfume mixtures or blends under paragraph 60 were proportionally reduced imports might have a foreign value of about \$900,000.

Duty increased by 50 percent.—If the duty on perfume mixtures or blends under paragraph 60 were proportionally increased, imports might have a foreign value of about \$500,000.

Exports

Exports of perfumes and cosmetics might be valued at approximately 7 million dollars in the post-war long-term period at the 1939 level of income or about the same as in 1939, and might increase to about 10 million dollars at the higher level of national income. France and some other European countries have an advantage because of their reputation and experience in the trade, but the United States producers excel in mass production and in output of synthetic organic chemicals used in perfumery.

Employment

The number of persons employed by domestic producers of perfumes and toilet preparations was about 15,000 in 1939. This number will probably not increase more than 10 percent in the post-war long-term period at the low level of income and not more than 20 percent at the higher level of income.

ACETYLENE BLACK*Tariff paragraph:* 71.*Commodity:* Acetylene black.*Rate of duty:* 10% ad valorem.

NOTE.—The rate fixed in the Tariff Act of 1930 was 20 percent ad valorem, which was reduced to 15 percent, effective January 1, 1936, and to 10 percent, effective January 1, 1939, pursuant to the trade agreements with Canada.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	2,382
Value (\$1,000).....	1,248
Unit value (per pound).....	\$0.104

¹ Foreign value.

Acetylene black is a bulky black pigment, light in weight, produced by the thermal decomposition of acetylene gas. Acetylene black is used principally in dry-cell batteries; it is used to a less extent in nonstatic rubber and to a still less extent in explosives. Before the war, probably 60 percent of the output of dry cells contained acetylene black; after the war this use is likely to increase as acetylene black has proved to be superior to other products for dry cells. Acetylene black cannot compete with the less-expensive carbon black as a pigment or in rubber compounding.

Acetylene black has not been made in the United States. In Canada, with its large production of synthetic calcium carbide, it has been economical to turn this chemical into acetylene gas and then acetylene black. Germany had but one producer. In order to meet the increasing wartime needs of the United States, including the creation of a stock pile, Canada had increased its annual rate of output from 8 million to 11 million pounds by the end of 1944.

With the exception of a few thousand pounds imported from Germany in 1937, all imports have been from Canada.

POST-WAR SHORT TERM

In the post-war short term the deferred civilian demand for dry cells probably will increase consumption above the 1939 level; but if the stock pile of acetylene black is disposed of rapidly, imports might be less than in 1939.

POST-WAR LONG TERM**Consumption, Production, and Imports**

Consumption of acetylene black seems to fluctuate somewhat with national income. Imports probably will continue to supply the entire consumption, especially since Canadian production facilities have been increased.

The reduction in duty on acetylene black from 20 to 15 percent ad valorem in 1936 and to 10 percent in 1939 had little, if any, effect on unit value. Not even a 50-percent decrease in the duty would make it competitive with domestic carbon black.

Per capita income at 1939 level.

With greater use of acetylene black in dry cells after the war, consumption and imports might be 45-65 percent above the 1939 level, or 3.5-4.0 million pounds with a foreign value, at 1939 prices, of \$365,000-\$415,000.

Per capita income 75 percent higher than in 1939.

Consumption of acetylene black might be 110-150 percent greater than in 1939, or 5-6 million pounds, with a foreign value, at 1939 prices of \$520,000-\$625,000. Prices of acetylene black increased only slightly in comparison with the increase of wholesale prices in the period 1936-41; with increased capacity installed, prices are not likely to go much above the 1939 level.

IRON PIGMENTS

Tariff paragraph: 73.

Commodity: Iron-oxide and iron-hydroxide pigments, n. s. p. f., natural and synthetic.

Rate of duty: 15% ad valorem on the synthetic; 20% ad valorem on the natural.

NOTE.—All iron-oxide and iron-hydroxide pigments, not specially provided for, were made dutiable in the Tariff Act of 1930, at the rate of 20 percent ad valorem. The duty on the synthetic pigments was reduced to 15 percent, effective January 1, 1939, pursuant to trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export ¹	For domestic market			
Quantity (1,000 pounds).....	81,600	8,730	72,870	16,914	89,784	Percent 19
Value (\$1,000).....	2,611	236	2,375	477		
Unit value (per pound).....	\$0.032	\$0.027		\$0.028		
Persons employed (number).....	1 250					

¹ Estimated.

² Foreign value.

This section covers all iron-oxide or iron-hydroxide pigments, natural or synthetic. The natural iron pigments are special types of iron ores which are the source of pigments. The synthetic pigments are usually prepared from scrap metal and from waste pickling liquors of the steel industry. They are both used principally in paint.

Before the war, imports of iron pigments came principally from Spain, the United Kingdom, and Germany. During the war, imports have been quite limited.

POST-WAR SHORT TERM

In the post-war short term, consumption, imports, and production of iron pigments are likely to be larger than in 1939, owing to the large deferred civilian demand for paints.

POST-WAR LONG TERM

Consumption, Production, and Imports

The consumption of iron pigments has shown a marked upward trend since 1931. During the war the domestic industry has been forced to expand its output and has improved both the quality and variety of its product. It seems probable that some of this increase will be held when imports are again fully available.

Per capita income at 1939 level.

United States consumption of iron pigments might be about 117 percent of 1939 consumption, or about 105 million pounds, depending in part on the assumption regarding duty, and as a result of an increase in population and an expected continuation of the trend toward larger use of these pigments. Because of the improvement in quality of domestic products, imports will probably furnish a smaller percentage of consumption than in 1939.

Duty as in 1939.—Imports might be about 16 percent of consumption, or about 17 million pounds, with a foreign value of about \$476,000, at 1939 prices. On the basis of these estimates of consumption and imports and allowing 10 million pounds for exports, production would be about 98 million pounds, with a value of about 3.1 million dollars, at 1939 prices.

Duty reduced by 50 percent.—This reduction in duty on iron pigments to 7½ to 10 percent ad valorem might increase imports to about 20 percent of consumption. This would be about 21 million pounds, with a foreign value of about \$588,000, at 1939 prices. Production would be about 94 million pounds, with a value, at 1939 prices, of about 3 million dollars.

Duty increased by 50 percent.—This increase in duty to 22½ to 30 percent ad valorem would probably reduce imports to about 12 percent of consumption, or about 13 million pounds, with a foreign value of \$364,000 at 1939 prices. Production would probably be about 10 million pounds, with a value, at 1939 prices, of about 3.3 million dollars.

Per capita income 75 percent higher than in 1939.

The consumption of iron pigments might be 180 percent of that in 1939, or about 162 million pounds, depending in part on the assumption regarding duty.

Duty as in 1939.—Imports might be about 16 percent of consumption or about 26 million pounds, with a foreign value of about \$832,000 at \$0.032 per pound. On the basis of these estimates of consumption and imports, and allowing about 15 million pounds for exports, production would be about 151 million pounds, with a value of about 5.4 million dollars, at \$0.036 per pound.

Duty reduced by 50 percent.—Imports might increase to about 20 percent of consumption, or 32 million pounds, with a foreign value of about 1 million dollars, at \$0.032 per pound. Domestic production would be about 145 million pounds, with a value of 5.2 million dollars, at \$0.036 per pound.

Duty increased by 50 percent.—This increase in duty might reduce imports to about 12 percent of consumption, or about 19 million pounds, with a foreign value of \$608,000, at \$0.032 per pound. Production probably would be about 158 million pounds, with a value of about 5.7 million dollars, at \$0.036 per pound.

Exports

Exports of iron pigments are not separately classified in statistics. However, it is thought that in 1939 about 80 percent of the reported exports of ochers, umbers, and iron-oxide pigments or 8.7 million pounds consisted of iron-oxide pigments. Reexports of iron oxide and iron-hydroxide pigments, n. s. p. f., are not separately classified, but are believed to be negligible.

With world income at about the 1939 level exports might be a little higher than 1939, owing to increase in population, and might amount to about 10 million pounds valued at \$270,000 at \$0.027 per pound. With world income 75 percent above 1939, exports might be about 15 million pounds, valued at \$465,000, at \$0.031 per pound.

Employment

There are no official statistics on the number of wage earners. It is estimated that there were about 250 wage earners in 1939. With the amount of production predicated at the higher level of income, employment in this industry might reach 380.

LITHOPONE, ZINC OXIDE, AND LEADED ZINC OXIDES

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
77	Lithopone and other combinations of zinc sulfide and barium sulfate containing by weight:		
	Less than 30% zinc sulfide.....	1½¢ per lb.	64%
	30% or more of zinc sulfide.....	1½¢ per lb. and 15% ad val.	41%
	Zinc oxide and leaded zinc oxides containing not more than 25% lead:		
	Dry powder.....	1¾¢ per lb.	39%
	Ground in or mixed with oil or water..	2¼¢ per lb.	26%

NOTE.—The rate on lithopone, etc., containing less than 30 percent zinc sulfide was reduced from 1¾ to 1½ cents per pound under the trade agreement with the Netherlands, effective February 1, 1936. The rates on zinc oxide and leaded zinc oxides were reduced to 1½ cents per pound on dry powder and to 1½ cents per pound on the material ground in oil or water under the trade agreement with Mexico, effective January 30, 1943.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports ¹	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	599,990	16,661	583,329	8,383	591,712	Percent 1.4
Value (\$1,000).....	28,794	926	27,868	277		
Unit value (cents per pound).....	4.8	5.6	4.8	3.3		
Persons employed (number).....	2,000					

¹ Consisting of lithopone and other combinations, etc., 5,282 thousand pounds, having a foreign value of \$131,000 at 2.5 cents per pound; zinc oxide and leaded zinc oxides, etc., 3,101 thousand pounds, having a foreign value of \$146,000 at 4.7 cents per pound.

² Foreign value.

³ Estimated.

Lithopone, a brilliant white pigment, is made by mixing solutions of zinc sulfate and barium sulfide (made from barytes) to form a precipitate of zinc sulfide and barium sulfate, which is subsequently treated to form the dry pigments of commerce. About 90 percent of the United States production of lithopone is the normal grade, containing less than 30 percent of zinc sulfide; the remainder is the high-strength grade, containing about 50 percent of zinc sulfide.

Zinc oxide is a brilliant, nonpoisonous white pigment. It is made by the French process from either slab spelter or scrap zinc and by the American process directly from the ore. The French process produces a lead-free grade; the American-process zinc oxide may be lead-free or contain lead in the form of basic lead sulfate.

Lithopone is used principally in paints and linoleum; leaded zinc oxide is used almost exclusively in paints; and lead-free zinc oxide is used principally in rubber and to a lesser extent in paints and ceramics.

All the white pigments compete with one another. Lithopone is one of the less-expensive white pigments but zinc oxide, white lead, and titanium dioxide, although more expensive, are in demand because of their physical properties. (White lead and titanium dioxide are not included in this section.) White pigments, arranged in order of rate of growth of consumption in the United States during 1932-39, the highest rate first, were as follows: Titanium dioxide, zinc oxide, white lead, and lithopone.

United States consumption of lithopone and zinc oxide has been supplied almost wholly by domestic production. Imports supplied but 1.4 percent of apparent consumption in 1939 and were about half the volume of exports.

Imports of lithopone have declined since 1928; the volume would have been even less if there had not been a marked decrease in foreign unit values. The Netherlands and Germany have supplied practically all imports. Imports of zinc oxide and leaded zinc oxide have decreased since 1932, while foreign unit values have increased. The United Kingdom, Belgium, and France were the principal suppliers. During the war, imports of lithopone have ceased and those of zinc oxide and leaded zinc oxide have become almost negligible and have been chiefly from Mexico.

POST-WAR SHORT TERM

In the post-war short term imports of lithopone, zinc oxide, and leaded zinc oxides are likely to be much smaller than in 1939, since it is assumed that Germany, the Netherlands, Belgium, and France, which supplied most of pre-war imports, will be slow in restoring production and exports.

POST-WAR LONG TERM

Consumption, Production, and Imports

United States consumption of lithopone and zinc oxides may be expected to continue to be affected by changes in the national income. Imports are likely to supply an even smaller part of consumption than before the war.

Per capita income at 1939 level.

United States consumption of lithopone and zinc oxides is likely to be about 600 million pounds or about the quantities consumed in 1939:

Duty as in 1939.—Imports may be about 1 percent of consumption or about 6 million pounds with a foreign value at 1939 prices of \$198,000. On the basis of these estimates, production for the domestic market would be about 594 million pounds with a value at 1939 prices of 28.5 million dollars.

Duty reduced by 50 percent.—Imports might be about 12 million pounds (or 2 percent of consumption) with a foreign value at 1939 prices of \$396,000. Production for the domestic market might be about 588 million pounds with a value at 1939 prices of 28.2 million dollars.

Duty increased by 50 percent.—Imports might be reduced to negligible proportions. Production for the domestic market might be close to 600 million pounds valued at 1939 prices at 28.8 million dollars.

Per capita income 75 percent higher than in 1939.

United States consumption of lithopone and zinc oxides will probably be about 850 million pounds.

Duty as in 1939.—Imports might be about 8.5 million pounds (or 1 percent of consumption) with a foreign value, at 3.7 cents per pound, of \$315,000. On the basis of these estimates, production for the domestic market would be about 842 million pounds with a value, at 5.4 cents per pound, of 45.4 million dollars.

Duty reduced by 50 percent.—Imports might be about 17 million pounds (or 2 percent of consumption) with a foreign value, at 3.7 cents per pound, of \$629,000. Production for the domestic market might be about 833 million pounds, valued at 5.4 cents per pound, or 45 million dollars.

Duty increased by 50 percent.—Imports might almost cease. Production for the domestic market might be about 850 million pounds, valued at 5.4 cents per pound, or 45.9 million dollars.

Exports

During the war, exports of lithopone and zinc oxide combined have increased many times over 1939 figures. The greater part of the increase in exports has been in shipments to Canada and to Latin American countries. After the war it is probable that exports to Canada will decrease drastically as Canada has installed additional production facilities and will probably turn to the United Kingdom for most of her import requirements. The Latin American countries may obtain their imports from continental European countries and the United Kingdom.

With the world income at the 1939 level, exports will probably be about 14 million pounds, or 84 percent of the 1939 level, which was about 22 percent above the 1937-39 average. Exports might be valued at 5.6 cents per pound or \$784,000. With world income 75 percent above 1939, exports might be 20 million pounds or more, valued at 6.3 cents per pound, or 1.3 million dollars.

Employment

There are no official statistics of the number of wage earners in this industry. It is estimated there were about 2,000 wage earners employed in producing lithopone and zinc oxides in 1939. With the increased production estimated for the higher level of income, post-war long-term employment might reach 2,500.

POTASSIUM CHLORATE

Tariff paragraph: 78.

Commodity: Potassium chlorate.

Rate of duty: 1½¢ per pound.

Equivalent ad valorem (1939): 27%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export	For domestic market			
Quantity (1,000 pounds).....	6,000		6,000	11,627	17,627	<i>Percent</i> 66
Value (\$1,000).....	570		570	1,644		
Unit value (per pound).....	\$0.095		\$0.095	\$0.06		
Persons employed (number).....	100					

¹ Estimated.

² Foreign value.

Potassium chlorate is a white, crystalline compound, with very strong oxidizing properties, made from potassium chloride. In peacetime usually about three-fourths of the United States consumption is used in the manufacture of matches. Most of the remainder is employed in the production of commercial explosives, with relatively small amounts consumed in pharmaceuticals and cosmetics. Since the outbreak of war, consumption has almost doubled. Not only has the entire increase gone into the manufacture of military explosives but some of the production formerly going into other uses has been diverted to this manufacture.

United States production of potassium chlorate from 1919 to 1938 was very small owing primarily to the high wholesale cost of the raw material, potassium chloride, used in its manufacture. Imports, over half of which were from Germany with smaller amounts from France, Switzerland, and Sweden, supplied almost the entire United States consumption. Since 1939, however, production capacity in this country has been enlarged to 21-22 million pounds per year using potassium chloride from the southwest.

The apparent consumption of 17.6 million pounds in 1939 is high for a pre-war year because it was the first year in which there was a substantial domestic production. Imports and apparent consumption, as United States production was then negligible, averaged 12.8 million pounds annually during the 5 years, 1934-38.

Since potassium chlorate has a direct military use it is assumed in the discussion below of post-war probabilities that there will be little or no revival of imports from Germany after the present war.

If the United States maintains a large Army and Navy after the war, there will be some consumption of potassium chlorate in the production of military explosives for their training. This consumption will probably be small in the immediate post-war period, because of large stocks of explosives in ordnance depots, but will likely amount to 1.5-2.0 million pounds a year in the post-war long term.

POST-WAR SHORT TERM

Probably domestic consumption of potassium chlorate will be much higher than the average consumption in pre-war years, though not so high as the apparent consumption in 1939. This increase seems

likely because of increase in population and a probable increase in the per capita consumption of matches, the production of which has been restricted during the war. If Germany is no longer a source, imports are likely to be small compared with pre-war years and the domestic industry will supply the great bulk of consumption.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

United States consumption of potassium chlorate, including military requirements, will probably be about 16 million pounds, assuming that at this level of national income there will be an increase in the production of matches in proportion to the increase in population. Average unit values of domestic production may be expected to be about the same as in 1939.

Duty as in 1939.—Imports of potassium chlorate might supply 13–19 percent of consumption, or 2–3 million pounds, with a foreign value of \$120,000–\$180,000, at 1939 prices. Some of the domestic match companies have formed subsidiary corporations for the production of potassium chlorate since 1939, and it is improbable that importers will be able to make sales other than to some of the smaller users. Domestic output accordingly may range between 13–14 million pounds, valued at \$1,235,000–\$1,330,000, at 1939 prices.

Duty reduced by 50 percent.—If this reduction in duty should make it possible for importers to supply almost all the civilian trade in this compound, except that consumed by the large match manufacturers, imports would amount to 20–30 percent of consumption, or 3.2–4.8 million pounds, with a foreign value of \$192,000–\$288,000, at 1939 prices, and domestic production would amount to 11.2–12.8 million pounds with a value of about 1.1–1.2 million dollars, at 1939 prices.

Duty increased by 50 percent.—Imports of potassium chlorate might fall to less than 6 percent of consumption, or to less than 1 million pounds valued at less than \$60,000, at 1939 prices, since at a rate of duty of 2½ cents per pound imports would probably drop to a low level and domestic production might amount to about 15 million pounds, valued at about 1.4 million dollars, at 1939 prices.

Per capita income 75 percent higher than in 1939.

Domestic consumption of potassium chlorate seems likely to increase only moderately as a result of such a high level of national income as this, for match consumption tends to vary more with population than with national income. An increase in consumption, including that for military purposes, up to about 18 million pounds, or roughly 40 percent above the average pre-war consumption, is expected. Average unit value of domestic production may be expected to be about 10 percent higher than in 1939.

Duty as in 1939.—Potassium chlorate imports will probably be only 11–17 percent of consumption or 2–3 million pounds with a foreign value of about \$130,000–\$200,000, at 6.6 cents per pound. The quantity is the same as that estimated for the lower per capita income level. As the increase in domestic consumption of chlorate of potash will probably be principally by producers of matches, it is not likely that importers will be able to secure much of the increased consump-

tion. Domestic production might be 15-16 million pounds, valued at 1.6-1.7 million dollars at 10.5 cents per pound.

Duty reduced by 50 percent.—Imports will probably be 17-28 percent of consumption or 3-5 million pounds, with a foreign value of from about \$200,000-\$330,000, at 3.6 cents per pound; domestic production might total 13-15 million pounds, valued at 1.4-1.6 million dollars, at 10.5 cents per pound.

Duty increased by 50 percent.—Imports might be below 6 percent of consumption or less than 1 million pounds with a foreign value of not more than \$66,000 at 6.6 cents per pound, and United States production would be in the neighborhood of 17 million pounds, valued at about 1.8 million dollars, at 10.5 cents per pound.

Exports

Exports were not separately classified in 1939 and the amount exported was very small. South American markets may absorb small exports during the first few years after the war, but it is to be expected that they may be lost to European competition thereafter.

Employment

The number of employees engaged in the domestic production of potassium chlorate after the war will probably be from 10 to 25 percent above the 1939 level, but the total number is not likely to exceed 125 persons.

POTASSIUM NITRATE

Tariff paragraph: 78.

Commodity: Refined potassium nitrate, or saltpeter.

Rate of duty: 1 cent per pound.

Equivalent ad valorem (1939): 27%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	¹ 1,000	(²)	¹ 1,000	5,208	6,208	<i>Percent</i> 84
Value (\$1,000).....	¹ 80	(²)	¹ 80	³ 191		
Unit value (per pound).....	⁴ \$0.08		³ \$0.08	\$0.037		
Persons employed (number).....	⁵ 100					

¹ Estimate based on trade information.

² Not available; exports believed to be small, if any.

³ Foreign value.

⁴ Based on domestic market quotation.

⁵ Less than 100.

Potassium nitrate, or saltpeter, refined, is obtained chemically by combining potash with nitric acid or with sodium nitrate, or by refining crude Chilean potassium nitrate. (Imports of duty-free potash and Chilean nitrate are discussed separately under potassic fertilizer materials, tariff paragraph 1865.)

Refined potassium nitrate is used chiefly in the manufacture of black powder (gunpowder), in the heat treatment of metals, and in curing meat. It is used to a lesser extent in the manufacture of special high-temperature heat-transfer media, glass, enamelware, and pyrotechnics and as a drug and chemical reagent.

The pre-war United States production of potassium nitrate was centered in the New York area, using crude Chilean nitrates and German potash. Domestic potash, produced in New Mexico and California, was not used because of the high transportation charges to the New York area. German producers of refined potassium nitrate, on the other hand, using German potash, were able to supply potassium nitrate on the east coast at relatively low prices. As a result, production in the United States was small.

Pre-war imports of refined potassium nitrate came principally from Germany, which supplied 78 percent of 1939 imports; France and the Soviet Union supplied the remainder. All three of the foreign producers have large supplies of cheap potash.

Before the war, the United States apparent consumption of potassium nitrate averaged about 4 million pounds annually, of which 2-3 million pounds were imported. In 1939, the apparent consumption increased to about 6 million pounds. This increase was caused principally by new and expanded peacetime uses. As a result of the war, consumption has increased tremendously and now amounts to about 25-40 million pounds annually, all of which is produced domestically.

POSTWAR SHORT TERM

Immediately after the war, consumption is likely to drop sharply from the wartime level, but may amount to twice the 1939 consumption. Imports from Germany are improbable, but small amounts may come from France and the Soviet Union. Under these circumstances domestic consumption would be supplied almost entirely by domestic production.

POST-WAR LONG TERM

Consumption, Production, and Imports

The new and expanded uses which appeared in 1939 may be expected to continue after the war. The ratio of imports to consumption, however, is likely to resemble the pre-war situation. Manufacturers of potassium nitrate in France and the Soviet Union will have available low-cost potash. The raw material cost of United States manufacturers will be considerably higher whether they use European, or United States potash, or Chilean crude potassium nitrate, mainly because of the high cost of transportation of the crude materials compared with the cost of shipping refined potassium nitrate.

Per capita income at 1939 level.

The consumption of refined potassium nitrate may revert to an amount between the average pre-war and the 1939 level, or 4-6 million pounds a year.

Duty as in 1939.—Imports may be expected to amount to from 75–90 percent of domestic consumption, or 3.0–5.5 million pounds valued at from \$110,000–\$200,000 (foreign value) at 1939 unit value. United States production for the domestic market may be expected to drop to 0.5–1.0 million pounds, valued at about \$40,000–\$80,000, at 1939 prices.

Duty reduced by 50 percent.—This change would tend to increase imports to from 85–95 percent of consumption, or to 3.5–5.7 million pounds a year, with a foreign value of \$130,000–\$210,000 at the 1939 unit value. United States production for the domestic market, on the other hand, would tend to decrease to about 0.3–0.5 million pounds, valued at about \$24,000–\$40,000, at 1939 prices.

Duty increased by 50 percent.—This change would tend to decrease imports which may supply 70–80 percent of consumption, or 2.8–4.8 million pounds with a foreign value of \$100,000 to \$175,000 at 1939 unit value. United States production for the domestic market would probably be about 1.2 million pounds, valued at about \$96,000, at 1939 prices.

Per capita income 75 percent higher than in 1939.

A per capita income at this level would tend to increase consumption to 10–12 million pounds. This quantity would be 65–100 percent above 1939 consumption.

Duty as in 1939.—Imports are likely to be about 8–11 million pounds, with a foreign value of \$400,000–\$550,000, based on a unit value of 5 cents a pound. United States production for the domestic market would tend to be about 10–20 percent of consumption, or 1–2 million pounds, valued at about \$90,000–\$180,000, at 9 cents a pound.

Duty reduced by 50 percent.—Imports might increase to 8.5–11.5 million pounds with a foreign value of \$425,000–\$575,000, based on a unit value of 5 cents per pound. United States production for the domestic market might be 0.5–1.5 million pounds, valued at about \$45,000–\$135,000, at 9 cents a pound.

Duty increased by 50 percent.—Imports might decrease to 7–10 million pounds with a foreign value of \$350,000 to \$500,000 at 5 cents a pound and United States production for the domestic market increase to 2–3 million pounds, valued at \$180,000–\$270,000, at 9 cents a pound.

Exports

Exports of refined potassium nitrate were negligible before the war, and in view of the higher cost of domestic production, will likely remain so after the war.

Employment

Data on the number of persons employed in the production of potassium nitrate are not available, but it is thought to have been less than 100 persons in 1939. The large wartime increase in production may have caused only about a twofold increase in persons employed, owing to the highly mechanized character of the process.

SOAP

Tariff paragraph: 80.

Commodity: Castile soap, toilet soap, and soap and soap powder, n. s. p. f.

Rate of duty: 15, 20, or 30% (plus excise tax on taxable oils contained therein). Equivalent ad valorem (1939): 17 to 51% (weighted average 28%).

NOTE.—The duties fixed in the Tariff Act of 1930 on the commodities covered by this report were as follows:

Castile soap, 15 percent ad valorem.

Toilet soap, 30 percent ad valorem.

Soap and soap powder, not specially provided for, 15 percent ad valorem.

The duty on toilet soap, when valued at more than 20 cents per pound, was reduced from 30 to 20 percent, effective January 1, 1939, pursuant to trade agreement with the United Kingdom. Since 1935 soap has been subject to a compensating import-excite tax when made from specially taxed oils. This tax is included in the equivalent ad valorem rates indicated above.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	3,560,740	35,129	3,525,611	3,252	3,528,863	Percent (¹)
Value (\$1,000).....	270,247	3,448	266,799	1,448		
Value (cents per pound).....	7.6	9.8	7.6	13.8		
Persons employed (number).....	20,191					

¹ Less than 0.1 percent.

² Foreign value.

Soap is a product obtained by treating animal or vegetable fats and oils with an alkali—usually sodium hydroxide—with or without the addition of other materials. It is marketed in various physical forms—bars, flakes, chips, granules, beads, powder, liquid, and paste—and is consumed for toilet and laundry purposes in the home, commercial laundries, and factories and offices. It is also used in certain industrial processes such as manufacture of synthetic rubber and wire drawings. The bulk of the output is consumed in the household.

Imports of castile soap have usually come principally from Italy and Spain, the largest producers of olive oil from which the soap is made. France and the United Kingdom have ordinarily been the principal sources of imports of other toilet soaps, and such imports have consisted largely of high-priced luxury goods.

During 1931-39 the quantity of soap consumed (measured by the quantity of fats and oils used in its manufacture) rose faster than population but only about one-half as fast as per capita national income. The apparent quantity consumed rose to a peak in 1941 (even after taking account of accumulation of stocks) but declined thereafter, largely because of restrictions imposed upon the uses of fats and oils in soap manufacture.

Apparently the volume of consumption has been influenced less by changes in price than by increasing emphasis on cleanliness, improved sanitation, and increased use of power laundering in the home. Consumption of industrial soaps appears to be closely correlated with industrial activity.

POST-WAR SHORT TERM

Annual consumption of soap might be about 15 percent higher than in 1939. This quantity would be in the neighborhood of the quantity actually consumed in the peak year 1941.

POST-WAR LONG TERM**Consumption and Imports**

The quantity of soap consumed in the United States is not likely to be greatly influenced by increase or decrease by 50 percent in the duties either on soap or on the fats and oils out of which soap is made. (The United States is on an import basis for such fats and oils.) A very large increase in per capita income, moreover, might result in only a moderate increase in the quantity consumed and, because of increased unit prices, a slightly larger increase in the total value of consumption.

The share of the total consumption that will be supplied by imports is not likely to be affected greatly by 50 percent increase or decrease in duty or by changes in income levels. The proportion would tend to be highest under conditions of low tariffs and high national income, and lowest under opposite conditions. Under all the assumed conditions, the total amount supplied by imports will no doubt be negligible in comparison with the total domestic consumption. In 1939, imports accounted for 0.1 percent of the quantity and for 0.2 percent of the value of domestic consumption.

Per capita income at 1939 level.

The total quantity of soap consumed (imported and domestic) might be about 15 percent above the 1939 level, principally because of the increase in population, but also because of an upward trend in per capita consumption. The total quantity would therefore amount to about 4 billion pounds. The quantity of soap imported might amount to about 3-4 million pounds, or about 0.1 percent of consumption, with a foreign value, at 14.5 cents per pound, of about \$435,000-\$580,000. United States production for the domestic market might be about 4 billion pounds, with a value, at 8 cents a pound, of about 320 million dollars.

Per capita income 75 percent higher than in 1939.

With this high per capita income, about 20 percent more soap might be consumed in the United States than in 1939, or about 4.2 billion pounds. The quantity of imports might total 4-6 million pounds, or a little over 0.1 percent of consumption, depending in part on the assumed rate of duty. Their total foreign value, estimated at 15 cents a pound would amount to \$600,000-\$900,000. United States production for the domestic market would be about 4.2 billion pounds, with a value, at 8.4 cents per pound, of about 350 million dollars.

Exports

Exports of soap from the United States have gone to many countries, not only those in the Western Hemisphere but also the Philippines, China, India, and European countries. Exports would probably increase with increased world income and lowered trade barriers. Exports might be within the range of 25-50 million pounds, valued at 2.5-5.0 million dollars.

Employment

There were 20,191 persons employed in the soap industry in 1939. Of these, 13,624 were factory wage earners. The rest were salaried employees (3,630), those engaged in distribution (2,521), construction (386), and others (30). An increase in production would probably not result in a corresponding increase in employment. A 20 percent increase, for example, might result in only a 5-10 percent increase in employment.

SALT

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
Sl	Salt:		
	For curing fish or meat.....	Free.....	
	Other.....	4¢ to 7¢ per 100 lb.	20% to 39%.

NOTE.—Packaged and bulk imports of salt were dutiable respectively under the Tariff Act of 1930 at the rates of 11 cents and 7 cents per 100 pounds. These rates were reduced, effective January 1, 1939, to 7 cents and 4 cents respectively, pursuant to trade agreements with the United Kingdom and Canada.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports			Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market	Free	Dutiable	Total		
Quantity (1,000 short tons).....	9,278	124	9,154	15	31	46	9,200	Percent 0.5
Value (\$1,000).....	24,510	611	23,899	28	73	101		
Unit value (per short ton).....	\$2.64	\$4.91	\$2.61	\$1.79	\$2.40	\$2.20		
Persons employed (number).....	4,500							

1 Foreign value.

Salt is produced in the United States as brine, evaporated salt, and rock salt. The proportion of the total annual output represented by each form was relatively constant during the 10-year period 1930-39, and averaged about 45 percent brine, 30 percent evaporated, and 25 percent rock. Brine is consumed at the point of production in the manufacture of chemicals. Both evaporated and rock salt are shipped to consuming centers and have many uses, chief of which are in the manufacture of dyes and chemicals, in meat packing, in the processing of foods, for livestock, for water softening, and for table and household use.

Consumption has varied with changes in population and national income.

During 1930-39, imports averaged less than 1 percent of consumption and exports averaged about 1 percent of production. In 1939, about 35 percent of the imports (largely from Jamaica) entered free of duty for curing fish; 60 percent was dutiable in bulk (largely from Jamaica and Canada) and 5 percent was dutiable in packages (largely from Canada).

POST-WAR SHORT TERM

The widespread use of salt as a raw material for and in processing of commodities indicates that shortly after the war both production and consumption may be considerably higher than they were before the war.

POST-WAR LONG TERM**Consumption, Production, and Imports**

It appears improbable that a 50 percent increase or decrease in the duty on salt would have any appreciable effect on production or imports. The United States produces more salt than it consumes, and imports considerably less than it exports. Nearly half of the total production is in the form of brine which is neither imported nor exported, and about one-third of the dry salt imported is duty-free. Most of the dutiable imports, which represent about one-third of 1 percent of consumption, is imported in bulk chiefly from Canada because of short hauls, and from Jamaica because of low transportation costs to the southern seaboard States. Previous reductions in duty (about 36 percent on packaged salt and 43 percent on salt in bulk in 1939) had no appreciable effect on imports.

Per capita income at 1939 level.

Assuming no increase over the 1939 level of per capita income, post-war consumption of salt in the United States may be in the neighborhood of 10 million short tons. Imports, as in the past decade, may account for no more than two-thirds of 1 percent of consumption. In quantity, they may be about 65,000 short tons, or about 40 percent greater than they were in 1939, with a foreign value of approximately \$143,000, at 1939 prices. Allowing about 100,000 short tons for export, production might be in the neighborhood of 10 million short tons, with a value, at 1939 prices (\$2.64 per short ton), of about 26.4 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption may be approximately 14 million short tons, of which about 95,000 short tons may be imported with a foreign value of about \$240,000. Allowing about 140,000 short tons for export, production might be about 14 million short tons, which, at prices 15 percent above 1939 prices or at \$3.04 per short ton, would have a value of about 42.6 million dollars.

Exports

Exports of salt averaged about 1 percent of production during 1930-39. After the war they are likely to be 100,000-140,000 short tons a year with a value, at \$5 a ton, of \$500,000-\$700,000.

Employment

The number employed in the production of salt was about 4,500 in 1939. With the assumed high national income, employment might increase to as many as 6,000.

SODIUM CHLORATE

Tariff paragraph: 81.

Commodity: Sodium chlorate.

Rate of duty: 1½ cents per pound. *Equivalent ad valorem (1939): 41.3%.*

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total (est.)	For export (est.)	For domestic market			
Quantity (1,000 pounds).....	8,000	10	7,990	3,759	11,749	<i>Percent</i> 32
Value (\$1,000).....	500	1	499	136		
Unit value (per pound).....	\$0.06	\$0.06	\$0.06	\$0.04		
Persons employed (number).....	40 to 50					

† Foreign value.

Sodium chlorate is a colorless crystalline compound which has strong oxidizing properties. About two-thirds of the amount consumed in the United States is used for killing weeds on farm lands and along railroad rights-of-way. The remainder is used for treating metals (to clean surface before rust-proofing), in the manufacture of soot-removing compounds, as an oxidizing agent in various chemical processes, and in the textile industry.

United States consumption of sodium chlorate increased from about 12 million pounds in 1939 to approximately 23 million pounds annually in 1943 and 1944. This increase is due partly to wartime uses but principally to use by farmers for the removal of field bindweed in the Western States. Under the Agricultural Adjustment Act, farmers have received payments up to 10 cents per pound for chemicals used in weed eradication.

Sodium chlorate is produced commercially by the electrolysis of common salt. The United States is an efficient producer because it has low-cost electrical power and abundant resources of salt. In 1939, when there was only one producer in the United States, output was estimated to have been about double the imports. Since 1939, however, United States capacity for the manufacture of sodium chlorate has expanded so that it now exceeds normal peacetime requirements.

Post-war consumption of sodium chlorate will depend largely on its use by farmers in the eradication of weeds. As long as that use is subsidized, consumption of the product will remain substantial, even if farm incomes decline. Consumption of the compound as a weed killer on railroad property and in various industrial uses will vary to a considerable extent with changes in business conditions.

Because of economies in production, the price of sodium chlorate is expected to remain fairly constant; domestic producers, utilizing their expanded productive facilities, may be expected to supply a much larger share of the domestic market than they did before the war.

Post-war imports will probably compete with the domestic product only in the eastern States, where they have an advantage in cost of transportation.

Imports have come principally from France, Germany, and Sweden.

POST-WAR SHORT TERM

Immediate post-war consumption will probably be substantially higher than in 1939. Imports may be quite small, as production in European countries probably will not return to normal for some time. Under these conditions domestic production would be considerably larger in the first few post-war years than it was in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

United States consumption of sodium chlorate will probably be about 20 million pounds or about 70 percent over that of 1939, particularly if the present soil-conservation policy of reimbursing farmers for weed eradication is continued. Consumption will not be appreciably affected by changes in the duty on imports and prices will probably be the same as in 1939.

Duty as in 1939.—Imports will probably supply 10 percent of consumption, and amount to about 2 million pounds, with a foreign value of \$80,000. Domestic production would accordingly be about 18 million pounds, valued at 1.08 million dollars, at 1939 prices.

Duty reduced by 50 percent.—Imports of sodium chlorate would probably supply 20 percent of consumption and amount to about 4 million pounds, with a foreign value of about \$160,000 at 1939 prices. United States production would probably be about 16 million pounds, valued at \$960,000.

Duty increased by 50 percent.—Imports would probably supply only about 5 percent of consumption and would amount to about 1 million pounds, with a foreign value of \$40,000. Production would be about 19 million pounds, valued at 1.1 million dollars.

Per capita income 75 percent higher than in 1939.

Domestic consumption would probably be about 25 million pounds at this higher income level, or 25 percent greater than at the 1939 level. Farm use of sodium chlorate as a weed killer does not seem likely to increase greatly, but the industrial uses of this compound would probably be much larger. Prices would not be likely to increase above those in 1939 because of the economies of large-scale production.

Duty as in 1939.—Imports would probably supply about 10 percent of consumption and would amount to about 2.5 million pounds with a foreign value of \$100,000. Domestic production would probably be 22.5 million pounds, valued at about \$1,350,000.

Duty reduced by 50 percent.—Imports would be likely to supply about half the market in the eastern States and would amount to approximately 5 million pounds. This amount would be 20 percent of total consumption and 33 percent above imports in 1939. The foreign

value of imports would be about \$200,000. Domestic production probably would be approximately 20 million pounds valued at about 1.2 million dollars.

Duty increased by 50 percent.—Imports would supply only about 5 percent of consumption and amount to only about 1¼ million pounds, with a foreign value of \$50,000. Domestic production would thus be about equal to approximately 23¼ million pounds, valued at about 1.43 million dollars.

Exports

Exports of sodium chlorate increased to almost 100,000 pounds annually during the war, but they are likely to decline to less than half that amount in the immediate postwar years and to become very small or negligible in the long-term post-war period.

Employment

The number of persons employed in the production of sodium chlorate after the war will probably be almost double the number employed in 1939 (40 to 50); accordingly, post-war employment will probably range between 80 and 100 persons.

SODIUM SILICOFLUORIDE

Tariff paragraph: 81.

Commodity: Sodium silicofluoride or fluosilicate.

Rate of duty: 1¼¢ per lb.

Equivalent ad valorem (1939): 78%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export ¹	For domestic market			
Quantity (1,000 pounds).....	12,886	.....	12,886	6,672	19,558	<i>Percent</i> 34
Value (\$1,000).....	482	.....	482	‡ 129	.....	.....
Unit value (per pound).....	\$0.04	.....	\$0.04	\$0.02	.....	.....
Persons employed (number).....	Less than 100	.....	.....	.....	.....	.....

¹ Exports are not available, but are believed to be very small.

[‡] Foreign value.

Sodium silicofluoride (sodium fluosilicate) is derived from silicon tetrafluoride, which is obtained as a byproduct in the manufacture of fertilizer superphosphate from phosphate rock. It is used chiefly as an ingredient in acid rinses in laundries and in the manufacture of iron enamelware and opalescent glass. It is also used as an ingredient in household insecticides.

Production of sodium silicofluoride depends primarily upon the amount of superphosphate produced, which, in turn, is governed by the demand for agricultural fertilizers. The amount of fluoride pro-

duced is further determined by the fluorine content of the ores processed and whether the plants in operation have recovery facilities.

United States consumption of sodium silicofluoride is relatively inelastic and has increased very little as a result of the war. However, domestic production has increased to about 20 million pounds, sufficient to replace the former imports.

Before the war, Denmark furnished between one-half and two-thirds of the total United States imports, Germany, Italy, and the Netherlands supplying most of the remainder.

POST-WAR SHORT TERM

The 1944 level of consumption of about 20 million pounds of sodium silicofluoride, valued at about 1 million dollars, will probably be maintained in the first few years after the war. This is equivalent to only a slight increase over the 1939 level of consumption. Domestic production is not likely to vary more than a few percent from the present level of 20 million pounds, or 55 percent over 1939 production. Imports, on the other hand, are not likely to be important, owing to the disruption of European production by the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—Consumption of sodium silicofluoride will probably be about the same as in 1939, about 20 million pounds. At this level, however, a decrease in the production of fertilizer superphosphate is likely; consequently United States production of sodium silicofluoride will probably decrease to about the 1939 level of 13 million pounds, with a value of about half a million dollars at 1939 prices. Imports, therefore, may be expected to expand again to the 1939 level of about 7 million pounds, with a foreign value of about \$140,000, at 1939 prices.

Duty increased or decreased by 50 percent.—The return to United States producers might be slightly affected, but probably there would be no marked change in the quantities produced and imported. In the past, several increases in the duty caused little change in the level of imports. Since United States production is as a byproduct, it will probably continue to depend on domestic production of superphosphate, and imports will furnish only the deficiency of supply.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Consumption might increase only by about 25–50 percent, or to 25–30 million pounds. Imports will probably total 8–13 million pounds, or 20–100 percent above those in 1939, with a foreign value of \$240,000–\$390,000, at 3 cents a pound. United States production for the domestic market may supply about 17 million pounds valued at about \$850,000, at 5 cents a pound. This amount would be equivalent to about 130 percent of production in 1939, and to 85 percent of present production.

Duty increased or decreased by 50 percent.—At this income level as well as at a 1939 level (see above), United States production may be expected to depend on production of superphosphate and, regardless of the duty, to leave only a deficiency in supply to be filled by imports.

Exports

Exports of sodium silicofluoride are negligible and are likely to continue so in the post-war period.

Employment

Data on the number of persons employed in the production of sodium silicofluoride are not available, but the number is believed to be less than 100 wage earners.

SODIUM HYDROSULFITE

Tariff paragraph: 82.

Commodity: Hydrosulfite compounds and sodium hydrosulfite.

Rate of duty: 35 percent ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption <i>Percent</i> ⁷
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	14, 732	(¹)	14, 732	1, 172	15, 904	
Value (\$1,000).....	2, 236	(¹)	2, 236	² 119		
Unit value (per pound).....	\$0. 15		\$0. 15	\$0. 10		
Persons employed (number).....	(³)					

¹ Exports are believed to be very small, if any.

² Foreign value.

³ Less than 100.

Sodium hydrosulfite is a colorless crystalline compound derived chemically from sodium bisulfite, which is obtained from the reaction of caustic soda and sulfur dioxide. It is used as such or in the manufacture of hydrosulfite compounds and the sulfoxylates. Sodium hydrosulfite and its compounds are powerful reducing agents. Sodium hydrosulfite is used largely in the textile industry to reduce indigo and other vat dyes. It is used also in bleaching soap and in certain chemical processes, such as the manufacture of the arsphenamines, which are medicinals derived from coal tar.

In the years immediately preceding the war, United States imports amounted to about 5 to 10 percent of domestic consumption; Czechoslovakia, the United Kingdom, and Switzerland were the principal suppliers.

POST-WAR SHORT TERM

Wartime consumption of sodium hydrosulfite and hydrosulfite compounds is probably two or three times as large as consumption in 1939, or about 30 to 45 million pounds a year. During the years immediately after the war the demand for printed calico and other vat-dyed textiles is likely to be large but not sufficient to support the wartime

rate of production. United States consumption will probably drop to about 25-30 million pounds. Imports of hydrosulfite were small before the war, and it is likely that they will be still smaller after the war. Thus, consumption in the United States will be supplied principally by domestic production.

POST-WAR LONG TERM

Consumption, Production, and Imports

The demand for sodium hydrosulfite and hydrosulfite compounds is derived principally from the demand for vat-dyed textiles. It will probably vary to a considerable extent with national income.

At any level of consumption, however, the division of the trade between domestic production and imports seems to be only to a slight degree a matter of price competition. The cost of the reducing agent is a small part of the cost of dyeing and an insignificant part of the cost of the dyed textile. Dyemasters will usually order their hydrosulfite from a customary source and of a brand that they have previously used, regarding price as a secondary consideration. It seems probable therefore that an increase or decrease in duty by 50 percent will have little effect upon the volume of production and imports. Prices may be expected to vary with the general price level.

Per capita income at 1939 level.

With per capita income at the 1939 level, the apparent consumption is likely to revert to the 1939 level, or to about 16 million pounds. Imports will probably not exceed the pre-war average of about 5 to 10 percent of consumption, and may be expected to amount to about 1.0-1.5 million pounds, with a foreign value of \$100,000-\$150,000, at 1939 prices. As a result, United States production for the domestic market would be about 15 million pounds, with a value of about 2.2 million dollars, at 1939 prices.

Per capita income 75 percent higher than in 1939.

A 75 percent increase in the per capita income is likely to cause a substantial increase in consumption, owing to the increased demand for vat-dyed textiles. Consumption would probably increase by 60 to 85 percent and amount to about 25-30 million pounds. Imports may be expected to supply about the pre-war average of 5 to 10 percent of the domestic consumption and amount to about 1.2-3.0 million pounds with a foreign value of \$138,000-\$350,000 at 11.5 cents a pound. United States production for the domestic market would supply the remainder, 22-29 million pounds, with a value of about 3.8-5.0 million dollars, at 17.2 cents a pound.

Employment

Data on the number of persons employed in the production of sodium hydrosulfite are not available, but the number probably does not exceed 100 wage earners. Employment would be affected only slightly by the increase in production estimated as a result of an increased national income.

CRUDE AND ANHYDROUS SODIUM SULFATE

Tariff para- graph	Commodity	Rate of duty	Equivalent ad valorem (1939)
81	Sodium sulfate: Anhydrous	\$3 per long ton	15%
1766	Crude	Free	

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consump- tion	Ratio of imports to con- sumption
	Total	For export	For domestic market			
Quantity (1,000 long tons):						<i>Percent</i>
Crude	1 238	(?)	238	133	371	38
Anhydrous	38		38	6	43	12
Value (\$1,000):						
Crude	1 2,719		2,719	1,394		
Anhydrous	690		690	98		
Unit value (per long ton):						
Crude	\$11.45		\$11.45	\$10.49		
Anhydrous	18.17		18.17	19.91		
Persons employed (number)	1 250					

¹ Estimated.

² Negligible.

³ Foreign value.

Crude sodium sulfate, or "salt cake," is produced chiefly as a co-product in the manufacture of hydrochloric acid from salt. Anhydrous sodium sulfate is crude sodium sulfate which has been refined and subsequently dehydrated. The crude grade is far more important than the anhydrous, constituting in 1939 more than 85 percent of the total production of crude and anhydrous, more than 95 percent of the total imports, and about 90 percent of the total consumption.

The most important use of crude sodium sulfate, aside from serving as a raw material for the manufacture of anhydrous sodium sulfate and Glauber salt (hydrated sodium sulfate) is in the manufacture of sulfate pulp. Nearly 65 percent of United States consumption of crude has been supplied by domestic production. Imports have come principally from Germany and Belgium.

Anhydrous sodium sulfate is used chiefly in the dye and textile industries. In 1929 United States production supplied about one-half of United States consumption of anhydrous sodium sulfate. By 1939 it had increased until it supplied about 90 percent. This change in ratio was due almost wholly to an increase in production and consumption while imports remained at about the 1929 level.

POST-WAR SHORT TERM

The rapid and continued growth of the dye, textile, and sulfate pulp industries indicate that consumption of both crude and anhydrous sodium sulfate will be much greater shortly after the war than it was in 1939. This increase will be caused largely by the removal of wartime restrictions on civilian consumption of wearing apparel and kraft pulp and paper.

POST-WAR LONG TERM

Per capita income at 1939 level.

It is probable that consumption might increase and be in the neighborhood of 390,000 long tons of crude and 60,000 long tons of anhydrous sodium sulfate.

Since crude is duty-free, it is probable that imports of crude will continue to supply 35 percent of consumption as they did in 1939, and will be in the neighborhood of 140,000 long tons. At 1939 prices, the foreign value of imports might be slightly less than 1.5 million dollars, or 5 percent higher than in 1939. United States production for the domestic market might be about 250,000 long tons and, at 1939 prices, might have a value of about 2.9 million dollars.

Duty as in 1939.—It is probable that imports of anhydrous sodium sulfate might represent the same proportion of consumption that they did in 1939, namely 12 percent, and might be in the neighborhood of 7,000 long tons. At 1939 prices, the foreign value of imports would be about \$140,000. United States production for the domestic market might be about 53,000 tons and, at 1939 prices, might have a value of about \$960,000.

Duty reduced by 50 percent.—If the duty were reduced by 50 percent, imports might supply about 25 percent of United States consumption and might total about 15,000 long tons. The foreign value of imports would be about \$300,000 at 1939 prices. United States production for the domestic market might be about 45,000 long tons, with a value, at 1939 prices, of about \$820,000.

Duty increased by 50 percent.—An increase of \$1.50 per long ton in the duty on anhydrous might reduce imports to about 5 percent of consumption, or to about 3,000 long tons, with a foreign value, at 1939 prices, of about \$60,000. United States production for the domestic market might be about 57,000 long tons and might have a value, at 1939 prices, of about \$1,035,000.

Per capita income 75 percent higher than in 1939.

Consumption might be in the neighborhood of 482,000 long tons of crude and 78,000 long tons of anhydrous.

Production and imports might supply the same proportion of consumption of crude that they did in 1939; in which case, production for the domestic market would account for 309,000 long tons and imports, for 173,000. United States production for the domestic market at \$13 per ton would have a value of about 4 million dollars; imported crude, at \$12 per ton, would have a foreign value slightly less than 2.1 million dollars.

A change in the rate of duty on anhydrous might affect the proportion of consumption supplied by imports.

Duty as in 1939.—Imports of anhydrous might supply the same proportion of consumption that they did in 1939, namely 12 percent, and might total about 9,000 long tons, with a foreign value of about \$210,000, assuming a price of \$23 a long ton. United States production for the domestic market might be about 69,000 long tons, which, at \$21 a ton, would be valued at about 1.4 million dollars.

Duty reduced by 50 percent.—If the duty on anhydrous were reduced by \$1.50 per long ton, imports might increase to 25 percent of consumption and might be about 20,000 long tons, or three times greater than they were in 1939. The foreign value of imports (at \$23 per long ton) might approximate \$460,000. United States production

for the domestic market might be about 58,000 long tons, which, at \$21 a ton, would be valued at about 1.2 million dollars.

Duty increased by 50 percent.—An increase of \$1.50 per long ton in the duty on imports of anhydrous might reduce imports to about 5 percent of consumption. Imports might total about 4,000 long tons, or 80 percent of the quantity imported in 1939. The foreign value of imports at \$23 per ton might be about \$92,000. United States production for the domestic market might be about 74,000 long tons, with a value, at \$21 per ton, of about 1.6 million dollars.

Exports

Exports of crude sodium sulfate and anhydrous sodium sulfate have been and are likely to continue to be negligible.

Employment

The number employed in the production of sodium sulfate was about 250 in 1939. With the maximum increase in production assumed as probable, there would be little if any increase in employment.

STARCHES

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem 1939
	Starches:		
83	Potato.....	1½¢ per lb.	78%
	Corn.....	1½¢ per lb.	31%
	Rice.....	1½¢ per lb.	44%
	Wheat.....	1½¢ per lb.	41%
	Starch, n. s. p. f.....	1½¢ per lb.	50%
1612	Arrowroot.....	Free	
1753	Sago.....	Free	
1781	Tapioca.....	Free	

NOTE.—The duty fixed by the Tariff Act of 1930 on potato starch was 2½ cents per pound. That rate was reduced to 1¾ cents per pound, effective February 1, 1936, pursuant to the trade agreement with the Netherlands.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export	For domestic market			
Quantity (1,000 pounds).....	1, 212, 833	192, 491	1, 020, 342	425, 919	1, 446, 261	Percent 29
Value (\$1,000).....	33, 338	4, 572	28, 766	² 6, 540		
Unit value (cents per pound).....	2.7	2.4	2.8	1.5		
Persons employed (number).....	6, 800					

¹ Does not include production of starch converted into sirup, sugar, or dextrine. These census figures, however, report production for sale; about 20 percent is probably duplication owing to sales by one plant to another for further processing.

² Foreign value.

This section covers all starches as a group. Competition among starches is chiefly between domestic cornstarch and imported tapioca starch. Only for potato starch—relatively unimportant in the total

starch field—is there significant direct competition between production and imports. This report does not include starches converted into sirup, sugar, or dextrine; production statistics are limited to starch sold as such.

The Netherlands Indies has been the principal source of tapioca and sago starches; the British West Indies, the principal source of arrowroot; and the Netherlands, the chief source of potato starch.

Starches are used in foods, in making textiles and paper, in manufacturing dextrine and adhesives, in laundries, and in a number of other less important uses. Each starch has special characteristics. The starch used for a particular purpose is determined chiefly by its price and its relative suitability for the purpose to be served. Cornstarch, tapioca starch, and sago starch are usually the least expensive, and in recent pre-war years tapioca starch has usually been somewhat lower in price than cornstarch. Laundries and most textile mills seem to prefer cornstarch. Manufacturers of wood glue use tapioca starch almost exclusively. The paper industry apparently buys chiefly on a price basis. Potato, wheat, rice, and arrowroot starches are relatively more expensive; their consumption is limited to special uses.

Consumption of starch in 1939 was somewhat higher than the average for 1935-39. About 68 percent of consumption was supplied by domestic starches, chiefly cornstarch. The following tabulation¹ shows the relation between average apparent consumption of the various starches and average imports during 1935-39:

Kind	Apparent consumption		Imports		
	Quantity	Percent of total quantity	Quantity	Percent of total imports	Percent of apparent consumption
Corn.....	1,000 pounds 720,492	66.2	1,000 pounds (1)	(1)	(1)
Tapioca.....	303,622	27.9	303,622	87.8	27.9
Potato.....	30,754	2.8	9,863	2.8	.9
Sago.....	25,864	2.4	25,864	7.5	2.4
Arrowroot.....	5,664	.5	5,664	1.6	.5
All other.....	1,952	.2	966	.3	.1
Total.....	1,088,348	100.0	345,979	100.0	31.8

¹ Included in "All other."

Since the war has interfered with the importation of tapioca starch, attempts have been made to supply a domestic substitute with similar characteristics. The commercial growth and processing of waxy corn was undertaken. Amylopectin, another substitute for tapioca starch, is fractionated from common cornstarch. Neither is expected to be able to compete in price with the lower grades of tapioca starch after the war, although they may continue to be used for some special purposes in place of high-grade tapioca. Domestic sweetpotato starch may offer somewhat greater competition to tapioca starch than it has in the past.

¹ Compiled from statistics of Corn Refiners Statistical Bureau for production of cornstarch, U. S. Department of Agriculture for production of potato starch, and U. S. Department of Commerce for imports and exports.

POST-WAR SHORT TERM

Immediately after the war, imports of starch are likely to be considerably smaller than in 1939 as it is assumed that the Netherlands will not export potato starch and the Netherlands Indies will export less tapioca. A number of large factories in the Netherlands Indies that produced tapioca starch are thought to have been destroyed.

POST-WAR LONG TERM**Consumption, Production, and Imports**

It is assumed that the Netherlands will again export potato starch' that capacity of the Netherlands Indies to produce and export tapioca starch will have been restored to the 1939 level by the reconstruction of large factories, and that the price relationship of cornstarch and tapioca will be approximately the same as in 1939. The future competition of waxy cornstarch, amylopectin, and sweetpotato starch is expected to be limited.

Before the war United States consumption of all starches manifested a long-term upward trend which is likely to continue. Consumption of starch may be expected to vary considerably with changes in business conditions.

Retaining the present duty on the dutiable starches—potato, rice, wheat, corn and starches, n. s. p. f.—or increasing the duty or decreasing it by 50 percent would probably have little effect on the total imports of starch. Dutiable starches, chiefly potato starch, make up about 3 percent of the imports of all starches. A change in duty would have some effect, however, on imports of the dutiable starches.

Per capita income at 1939 level.

Consumption of starch is likely to equal that in 1939, or about 1,450 million pounds. Imports probably would furnish about 30 percent of consumption, or about 435 million pounds, with a foreign value, at 1939 prices, of 6.7 million dollars. United States production for the domestic market might be about 1,015 million pounds, with a value, at 1939 prices, of about 28 million dollars.

Per capita income 75 percent higher than in 1939.

The demand for starch might be about 35 percent higher and consumption might be about 1,960 million pounds. Imports probably would be about 30 percent of consumption, or about 590 million pounds (135 percent of 1939 imports), with a foreign value of 10 million dollars, at a foreign unit value of 1.7 cents a pound. United States production for the domestic market might be about 1,370 million pounds, with a value of about 42 million dollars, at a unit value of 3.1 cents a pound.

Exports

Exports of cornstarch are governed principally by the relation of the price of corn in Chicago to that of Argentine corn in Liverpool. United States exports of cornstarch have been large when the price of Argentine corn in Liverpool has exceeded the price of No. 3 yellow corn in Chicago; they have been small when prices in Liverpool have been below those in Chicago. The British and continental factories producing cornstarch (many of them American-owned subsidiaries)

will probably use Argentine corn to produce their own and other continental requirements of cornstarch as long as the Liverpool price of corn is below that of the Chicago price.

Until the European output of starch and international trade in tapioca and sago reach pre-war levels, exports of cornstarch from the United States might be substantially above 1939 levels.

If the price of corn in the United States is above world prices after the war the export of cornstarch will be handicapped unless exports should be subsidized in some way. In any event exports of cornstarch may be less than in 1939, when they were abnormally high. Very roughly they may be estimated at from 100-150 million pounds annually.

Employment

The number of wage earners employed by the industries producing starch in 1939 was 6,764; about 94 percent were employed by the corn wet-milling industry and 6 percent by the industries producing potato, rice, and wheat starches. The corn wet-milling industry also produces cornstarch, corn sirup, corn sugar, and other products, and the same equipment is used up to a certain stage in the manufacture of the several products. Changes in the quantity of corn ground and in starch production are not quickly reflected in changes in the number of employees since much of the equipment requires attention even when not used to capacity. Under the assumed conditions, employment would probably be the same as in 1939 or 10 percent higher.

DEXTRINE

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
84	Dextrine, made from potato starch or potato flour.	2½¢ per lb.	71%
	Dextrine n. s. p. f., dextrine substitutes, burnt starch or British gum, and soluble or chemically treated starch.	2¢ per lb.	47%

NOTE.—The duty fixed by the Tariff Act of 1930 on dextrine made from potato starch or potato flour was 3 cents per pound. That rate was reduced to 2½ cents per pound, effective February 1, 1936, pursuant to the trade agreement with the Netherlands.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export	For domestic market			
Quantity (1,000 pounds).....	150,000	8,667	141,333	3,371	144,704	Percent 2.3
Value (\$1,000).....	5,250	385	4,865	² 133		
Unit value (cents per pound).....	3.5	4.4	3.4	3.9		
Persons employed (number).....	300					

¹ Estimated.
² Foreign value.

Dextrine is produced by heating starches alone or with an acid. Dextrines are largely used as adhesives, for sizing paper and textiles and in textile printing and finishing. The dextrines produced from different starches have different characteristics and each is preferred in certain uses.

Imported dextrine, chiefly potato dextrine, is used largely for the production of special finishes for fine textiles and in the manufacture of library paste. Imports of dextrine have been chiefly from the Netherlands and Germany.

Most of the dextrine produced in the United States is made from cornstarch; large quantities are made from imported tapioca and smaller amounts from imported sago and from domestic and imported potato starch. United States production of potato dextrine has been small but has expanded during the war. Potato dextrine is more expensive than corn dextrine and tapioca dextrine.

United States consumption of all dextrines showed a long-term trend toward increase before the war and this trend may be expected to continue after the war. It also may be expected from the nature of dextrine uses that consumption will continue to show considerable response to increases and decreases in the national income. Corn dextrine and tapioca dextrine consumption will probably constitute the greater part of the total.

POST-WAR SHORT TERM

In the post-war short term, consumption and production of dextrine are likely to be larger than in 1939 owing to the large national income; however, imports of dextrine are likely to be small, since it is assumed that the Netherlands and Germany will not be exporting.

POST-WAR LONG TERM

Consumption, Production, and Imports

It is assumed that by this time the Netherlands and Germany will again be exporting dextrine.

In the United States corn dextrine is made from domestic cornstarch; tapioca and sago dextrines, from starches imported free of duty. There is little likelihood of large imports of these dextrines which supply the greater part of United States dextrine consumption, even if the duty on these dextrines were reduced by 50 percent (or to 1 cent per pound). United States consumption of potato dextrine in 1939 probably totaled not more than 5.3 million pounds, or only 3.7 percent of the consumption of all dextrines. This quantity may be regarded roughly as an upper limit for the ratio of imports to consumption in the post-war period. Actually it will probably be much less, even with a 50-percent reduction in duty, because some of the wartime increase in United States production of potato dextrine is likely to be retained.

Per capita income at 1939 level.

United States consumption of dextrine will probably be a little higher than in 1939 or about 155 million pounds. Production for the domestic market would be about 152 million pounds, with a value of about 5.2 million dollars, at 1939 prices.

Duty as in 1939.—Imports may constitute 1.8 percent of consumption, or about 2.8 million pounds, with a foreign value of about \$109,000, at 1939 prices.

Duty reduced by 50 percent.—With a reduction in duty, imports might increase to about 2 percent of consumption, or about 3.1 million pounds, with a foreign value of \$121,000, at 1939 prices.

Duty increased by 50 percent.—Imports might be reduced to little more than 1.5 percent of consumption, or about 2.5 million pounds, with a foreign value of \$96,000, at 1939 prices.

Per capita income 75 percent higher than in 1939.

Consumption of dextrine might be 155 percent of that in 1939, or about 225 million pounds. United States production for the domestic market would be about 221 million pounds, with a value of about 8.4 million dollars, at 3.8 cents per pound.

Duty as in 1939.—Imports might be about 1.8 percent of consumption, or about 4 million pounds, with a foreign value of about \$176,000, at 4.4 cents per pound.

Duty reduced by 50 percent.—A reduction in duty might bring about an increase in imports to 2 percent of consumption, or 4.4 million pounds, with a foreign value, at 4.4 cents per pound, of \$194,000.

Duty increased by 50 percent.—This increase in duty might bring about a reduction in imports to a little more than 1.5 percent of consumption, or to about 3.6 million pounds, with a foreign value of \$158,000, at 4.4 cents per pound.

Exports

Exports of dextrine consist largely of corn dextrine. With world income at about the 1939 level, exports might be about 9 million pounds valued at \$396,000, at 4.4 cents per pound. With world income 75 percent above that of 1939, exports might total about 13 million pounds and might have a value of \$650,000, at 5.0 cents per pound.

Employment

There are no official statistics on the number of wage earners producing dextrine. Three members of the corn wet-milling industry produce corn dextrine along with cornstarch, corn sugar, corn sirup, and other products of the industry; a few other large concerns make dextrines and adhesives from purchased materials, domestic and imported. Probably 300 wage earners are employed in the manufacture of dextrine. With the amount of production predicated at the higher income, post-war employment might reach 375.

SPIRITS OF TURPENTINE

Tariff paragraph: 90.

Commodity: Spirits of turpentine.

Rate of duty: 5 percent ad valorem.

NOTE.—The foregoing rate is that fixed in the Tariff Act of 1930. It was reduced pursuant to the Mexican trade agreement, effective January 30, 1943, to 2½ percent ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 gallons).....	30,239	11,865	18,374	923	19,297	Percent 14.8
Value (\$1,000).....	7,560	3,174	4,386	130		
Unit value (per gallon).....	\$0.25	\$0.27	\$0.24	\$0.14		
Persons employed (number).....	3,400					

¹ Actual consumption estimated at 24 million gallons; ratio of imports to this consumption, 3.8 percent.

² Estimated.

³ Foreign value.

Spirits of turpentine is a colorless oily liquid derived from the sap of the long leaf or slash pine tree through the intermediate products, gum turpentine, wood turpentine, and sulfate wood turpentine. Gum turpentine is the oleoresin collected from incisions in the trunk of the living pine tree. Wood turpentine is produced by the destructive or steam distillation of pine wood waste, usually pine-tree stumps from cut-over forest land. Sulfate wood turpentine is obtained from the digestors of paper mills, which use pine wood as a raw material and the sulfate process to remove the lignin from the wood pulp.

In the distillation of spirits of turpentine, rosin is also produced, being left in the still as a residue after the distillation process is completed. Production is roughly in the proportion of 1 gallon of turpentine spirits to 30 pounds of rosin.

Turpentine spirits is used principally as a thinner for paints and varnishes. In this use it must compete with the less expensive mineral spirits. Approximately 75 percent of the domestic consumption of turpentine spirits is as over-the-counter sales to professional painters. It is also used in shoe polish, as a raw material for the production of synthetic camphor, and in medicinal, insecticide, and disinfectant preparations.

The United States is the principal world producer of spirits of turpentine, usually producing between 30 million and 35 million gallons, or about 60 percent or more of the world output. During pre-war years the United States usually consumed about two-thirds of its production, or between 20 million and 22 million gallons. Apparent consumption during 1939 was approximately 19.3 million gallons; actual consumption, however, was about 24 million gallons, domestic stocks having been reduced 4.7 million gallons during the year.

The United States usually exported from 10 million to 12 million gallons in pre-war years. Exports went principally to the United Kingdom, the Netherlands, Germany, Canada, and Belgium. During the war years, exports have dropped to about one-third or less of their former quantity.

United States imports of spirits of turpentine during the 5-year period, 1936-40, averaged only 807,000 gallons a year (less than 10 percent of exports), and were practically all from Mexico. These imports entered principally at El Paso, Tex., and were consumed primarily in the adjacent area.

The price of spirits of turpentine has varied considerably. During 1931-40 the price ranged between a high of 47½ cents and a low of 23½ cents per gallon and averaged 37½ cents. Mineral spirits, a petroleum product which is used, like turpentine, as a paint and varnish thinner, sells at only 10 to 12 cents a gallon. Consumption of mineral spirits is roughly four to five times that of spirits of turpentine. Spirits of turpentine, however, is usually preferred by the painters, even at a price three to four times as high.

POST-WAR SHORT TERM

Because of greater activity in the painting of houses, United States consumption will probably increase considerably after the war. Exports, which have fallen to about one-third of their pre-war volume, will probably increase but are not expected to reach their former average. Imports will probably be about their pre-war average volume.

POST-WAR LONG TERM

Consumption, Production, and Imports

United States consumption of spirits of turpentine has varied very closely with the national income. The production of turpentine spirits is linked with that of rosin; and its consumption is affected by its competitive position compared with that of mineral spirits, a much cheaper paint and varnish thinner. A decrease by 50 percent in duty will probably not increase the quantity of imports to any great extent because the area in which imports can compete is so limited and because Mexican production is small. An increase of 50 percent in the duty will probably cause a slight decrease in the small imports.

The average price of domestic spirits of turpentine and the average unit value of imports were unusually low in 1939. In estimating post-war values, prices higher than those in 1939 and fairly close to pre-war averages have been assumed.

Per capita income at 1939 level.

Consumption will probably be about 26.5 million gallons. Imports will probably be 3 percent of consumption or about 800,000 gallons, with a foreign value of \$240,000, at 30 cents a gallon. Production for the domestic market would accordingly be about 25.7 million gallons, with a value of 10.3 million dollars at 40 cents a gallon.

Per capita income 75 percent higher than in 1939.

Imports might be as much as 1 million gallons or slightly less than 3 percent of consumption. At 35 cents per gallon imports would have a foreign value of \$350,000. United States consumption might be about 36 million gallons. Production for the domestic market is likely to be about 35 million gallons, having a value of 15¼ million dollars at 45 cents a gallon.

Exports

United States exports of spirits of turpentine will not probably reach their pre-war level because of increasing production of this commodity in foreign countries and the expanding use of mineral spirits as a paint and varnish thinner in world trade.

At the lower level of income, exports will probably be about 7½ million gallons with a value of 3 million dollars, at a unit price of 40 cents a gallon. At the higher level of income, exports will probably be approximately 10 million gallons, with a value of 4.5 million dollars, at 45 cents a gallon.

Employment

The total number of persons employed (wage earners plus salaried employees) in the production of spirits of turpentine is estimated at about 3,400 in 1939, but those were also responsible for the production of the coproducts, rosin, pine oil, and other naval stores derivatives. During the long-term period at the lower level of income, employment might amount to 3,800 persons and at the higher level of income to about 5,000 persons.

VANILLA BEANS

Tariff paragraph: 92.

Commodity: Vanilla beans.

Rate of duty: 15 cents per pound. *Equivalent ad valorem (1939):* 4.4%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 30 cents per pound, which was reduced to 15 cents, effective June 15, 1936, pursuant to the agreement with France.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	1, 018
Value (\$1,000).....	1 3, 502
Unit value (per pound).....	\$3. 44

1 Foreign value.

Vanilla beans are not produced in the United States. They are imported principally from Madagascar, Mexico, and French Oceania and are used as a source of natural flavoring material for confectionery, foods, liquors, and similar products. Consumption in the United States was about 1 million pounds, with foreign value of about 3.5 million dollars in 1939.

Cured vanilla beans contain approximately 12 percent extractable oleoresins and other aromatic constituents, of which vanillin is the most important. About 25 percent of the flavor of the natural extract is due to vanillin, and the remainder to several other aromatic constituents that give the natural product a rich full aroma which has never been produced synthetically. The average unit value of imported vanilla beans in 1939 was \$3.44 a pound, which is equivalent to about \$28 a pound in terms of the extractable flavoring principles.

(There is considerable range in the quality of vanilla beans; the two best varieties are Mexican and bourbon.) Synthetic vanillin (100 per cent) sold at about \$2.35 a pound in 1939 and the domestic production amounted to 608,614 pounds. It is apparent that, even at the much higher price, natural flavor from vanilla beans is preferred by many users.

POST-WAR SHORT TERM

During the first few years after the war, the consumption and imports of vanilla beans will probably increase from 10 to 25 percent.

POST-WAR LONG TERM

Consumption and Imports

A reduction or increase of 50 percent in the present duty of 15 cents a pound on vanilla beans would probably not materially affect the quantities consumed. The inelastic nature of the demand for vanilla beans is due to the relatively small cost of the flavor to the total cost of most products in which it is used and to the fact that the much cheaper synthetic vanillin has already been substituted generally wherever the cost of flavor is important.

Per capita income at 1939 level.

With the United States per capita income at the 1939 level, but with a 10-percent increase in population, the consumption of vanilla beans will probably amount to about 1.1 million pounds annually, valued at about \$2-\$4 a pound, depending on the quality of the beans. The foreign value of these imports would amount to about 2-4 million dollars.

Per capita income 75 percent higher than in 1939.

If national income were 75 percent more than what it was in 1939 and population were 10 percent more, consumption of vanilla beans might possibly increase by 30-50 percent, or to 1.3-1.5 million pounds annually, with a foreign value of about \$2-\$4 a pound, or 2.5-6.0 million dollars. This increased consumption of vanilla beans would be due chiefly to greater quantities of high-quality ice cream and confectionery consumed.

TONKA BEANS

Tariff paragraph: 92.

Commodity: Tonka beans.

Rate of duty: 25 cents per pound.

Equivalent ad valorem (1939): 16%

NOTE.—The tariff act rate of 25 cents per pound was reduced to 12½ cents per pound, effective December 16, 1939, pursuant to the trade agreement with Venezuela.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds)-----	625
Value (\$1,000) ¹ -----	945
Unit value (per pound) ² -----	\$1. 51

¹ Foreign value.

² The unit value in 1939 was unusually high, the average unit value per pound over the period 1933-42 being only \$1.07.

Tonka beans are not grown in the United States. Imports come principally from Venezuela and Brazil, and, as a reexport, from Trini-

dad and Tobago. They are imported as a source of natural flavoring material, chiefly used to flavor tobacco products, but to a smaller extent in perfumes, in tonka-bean extract, and mixed with vanillin in artificial vanilla flavor. Coumarin, the principal flavoring constituent of tonka beans, is present to the extent of about 3 percent of their weight. At 3 percent, the 1939 imports of 625,000 pounds would yield about 19,000 pounds of coumarin. The price of tonka beans is affected by crop fluctuations more than by changes in demand; and on the basis of the average price in the past the value of tonka-bean imports required to produce 1 pound of coumarin would be at least \$50. In 1939, the production of synthetic coumarin, produced from phenol, a coal-tar intermediate, amounted to 235,633 pounds, which sold at an average price of about \$2.88 per pound. The continued use of the more expensive natural flavor is probably partly because the beans contain other aromatic principles besides coumarin and partly because certain manufacturers rather than change their flavoring formulas for certain brands of tobacco products continue to use tonka-bean extract for flavoring regardless of price.

For the purpose of this report, it is assumed that in both post-war short and long terms, tonka-bean flavoring will continue to be used in the same brands as it is used at present, and that there will be no material extension of its use. On this basis, the consumption of tonka beans will vary with the sales of those brands in which extract of tonka beans is now used. Such sales will, in turn, vary with the total volume of tobacco products consumed and with the proportions of consumption supplied by those brands. If past trends should continue, total consumption of tobacco and tobacco products will increase with the population but will be affected by changes in per capita income only to a moderate extent. The derived and inelastic nature of the demand for tonka beans makes it probable that an increase or a decrease of 50 percent in the 25-cent duty (now reduced to 12½ cents per pound) would not materially affect consumption.

For the following discussion it is assumed that the consumption of the brands of tobacco in which tonka-bean flavoring is used will vary proportionately with the consumption of total tobacco products.

POST-WAR SHORT TERM

It seems probable that the consumption and imports of tonka beans might be 10-20 percent higher than in 1939, and amount to something like 700,000-750,000 pounds annually. Assuming a price of \$1 to \$1.10 per pound, these imports would be valued at \$700,000-\$800,000.

POST-WAR LONG TERM

Per capita income as in 1939 with or without change in duty.

On the assumption that was made for the post-war short term, consumption and imports of tonka beans might be 10-30 percent higher than in 1939, or to, say, 700,000-800,000 pounds annually. Assuming the same price, these imports would be valued at \$700,000-\$900,000.

Per capita income 75 percent higher than in 1939 with or without change in duty.

Again, under the same assumption, consumption and imports of tonka beans might increase by 20-50 percent, or to about 750,000-950,000 pounds annually. Assuming the same price, these imports would be valued at \$750,000-\$1,000,000.

CRUDE PETROLEUM

Tariff paragraph: 1733.

Commodity: Crude petroleum.

Rate of duty: Free of regular duty, but subject to import-excise tax of 21¢ per barrel. *Equivalent ad valorem (1939):* 30%.

Notes.—No duty was imposed by the Tariff Act of 1930, but an import-excise tax of ¼ cent per gallon was imposed by the Revenue Act of 1932, effective June 21, 1932. The tax was reduced to ¼ cent, effective December 16, 1939, subject to tariff quota limitations, pursuant to the agreement with Venezuela. On January 30, 1943, the tax of ¼ cent per gallon was made applicable to all imports, without quota limitations, pursuant to the agreement with Mexico.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption ¹	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million barrels).....	1,265	72	1,193	29	1,222	Percent ² 2.3
Value (million dollars).....	1,294	93	1,201	20		
Unit value (per barrel).....	\$1.02	\$1.28	\$1.01	\$0.69		
Persons employed (number).....	200,000					

¹ As to significance of this column, see text below.

² Not including 5.5 million barrels, valued at 3.7 million dollars, imported for refining in bond and export of the derivative products.

³ Foreign value.

Crude petroleum is in demand only as a source of finished oils. Virtually all of the consumption is in refinery plants. The crude oil handled by United States refineries goes predominantly into refined products for consumption in this country, but there are also large exports of the finished products. In 1939 such exports of liquid products (not including bunker oil but including "natural gasoline" derived from natural gas) amounted to 108 million barrels, equal to about 9 percent of the apparent consumption of crude petroleum. Those refined petroleum products which are import items of consequence are discussed in separate sections.

The foregoing tabulation relates to crude petroleum and does not cover the large exports of refined petroleum products or the small imports of those products. Apparent consumption, as given, consequently includes the crude petroleum (domestic or imported crude) entering into the exports of 108 million barrels. The quantity of crude required for a given quantity of refined products is approximately barrel for barrel. The apparent consumption of crude for conversion into products for the domestic market in 1939 was, therefore, about 1,115 million barrels. In addition to products obtained from crude petroleum, more than 50 million barrels of natural gasoline were produced and entered into consumption; also, stocks were reduced during the year by more than 40 million barrels. Therefore, actual United States consumption of petroleum products in 1939 was approximately 1,210 million barrels. The subsequent estimates of consumption of crude petroleum (plus natural gasoline) in this report relate only to consumption for the production of refined products which are to be consumed in the United States, a figure which can be estimated with some approach to accuracy.

Imports of crude petroleum in the immediate pre-war period were chiefly from Venezuela, with relatively small quantities from Mexico and Colombia.

In 1939, in addition to imports of crude petroleum, about 8 million barrels of taxable refined or semirefined oils for actual consumption in the United States were imported, besides which about 19 million barrels of such products were imported (tax free) either for further manufacture in bond or for supplies of vessels (mainly fuel oil).

Difficulty of forecasting domestic production.

It is possible to estimate with some reasonable approach to accuracy the post-war demand in the United States for petroleum derivatives as a group, and for the principal individual products. The great bulk of these derivatives destined for domestic consumption will presumably be produced in United States refineries, whether or not the refineries supplement supplies of domestic crude petroleum by imports of that material.

The question how much crude petroleum might be imported, under given assumptions as to demand for the derivative products or to rates of duty on imports, depends primarily on the volume of production of crude petroleum in the United States. To a less extent it depends on the quantity of crude petroleum and refined petroleum products exported from the United States. Under any circumstances, however, both imports and exports of petroleum and its products are likely to be fairly large. Various causes tend to bring about trade in both directions—among others, geographic convenience and economy of transportation, corporate relationships between domestic and foreign concerns, differences in grade between domestic and foreign crude oils, and temporary local variations in supply and in prices.

Intercorporate relationships constitute one of the principal difficulties in forecasting both imports and exports of crude and refined petroleum. Virtually all of the production of crude petroleum in Venezuela, Colombia, and Peru (which together account for the great bulk of South American production), as well as of the production of refined products in the Netherlands West Indies (the dominant center of refining in the Western Hemisphere outside of the United States), is controlled by a very small number of concerns, which also produce and market both crude and refined products on a large scale in the United States. These and other large American concerns have extensive interests in petroleum production and refining in the Eastern Hemisphere, and in marketing petroleum products in many foreign countries. The policy of a concern of this sort with respect to imports of its own foreign products into this country, and exports of its own domestic or foreign products to other countries, may be materially affected by its foreign operations. Notwithstanding the effects of such international corporate relationships, however, the ratio of imports to exports of petroleum (in all forms combined), in the aggregate, will still depend largely on the ratio of production of crude petroleum in the United States to consumption of refined products in this country.

There are very few products the future output of which is so difficult to forecast as that of crude petroleum. Production in the United States in the past has been, on the whole, steadily increasing,

but the rate of increase has varied materially at different times. Moreover, productive capacity has shown even wider variations in the rate of growth than has actual current production. Changes in productive capacity depend mainly on the rate at which new pools and fields are discovered. Without constant new discoveries, production is bound to decline. At times exceptionally large discoveries have brought about large overcapacity, and it has been necessary to restrict production severely, by government as well as private measures. At other times, with less rapid discovery of new supplies, oil has been drawn from previously developed producing areas at a more rapid rate than was consistent with ultimate maximum recovery. It seems likely that if the present war continues for some time, the huge military requirements for petroleum, despite civilian rationing, will lead to current production at a rate which is uneconomic from this standpoint.

It is quite impossible to forecast how rapidly new reserves will be discovered in the United States in the future. Prospecting and "wildcatting" in recent years have proceeded with a more or less uniform pace, but with success varying widely from year to year and from period to period. The richest field ever discovered in the United States was that of East Texas, which began producing in the latter part of 1930. For several years both before and after discovery of the East Texas field there were rather large discoveries in several other areas. Since about 1938 the rate of additions to known productive capacity has been much lower, but it is entirely possible that it may again rise in the future. Opinions of experts with regard to the extent of the undiscovered oil deposits of the United States vary enormously. Almost as marked are the variations in expert opinion with respect to the rate at which these untapped resources will be brought into use.

If, between the present and the first half of the 1950 decade, the rate of discovery of new supplies of petroleum should be at the average rate of 1935-39 (a period not including the opening up of the great East Texas field), domestic production would probably become sufficient to take care of the estimated increase in the consumption of refined products in the United States (even with a high per capita national income), besides maintaining approximately the pre-war volume of exports of refined products. On the other hand, if the rate of discovery should be no greater than that during 1940-44, domestic production would probably be insufficient to take care of the estimated domestic requirements, even if there should be a reduction in the exports of refined oils.

Since, under given conditions of national income, the demand for petroleum products in this country is very inelastic, being only moderately affected by changes in price, whatever gap may exist between domestic consumption (plus exports) and domestic production of crude will be made up by imports. The practical impossibility of forecasting satisfactorily domestic production of crude petroleum makes it impossible to forecast the imports of crude, apart from the uncertainties, already mentioned, concerning the policies of concerns which have production facilities both in the United States and in foreign countries.

Post-war exports of crude and refined petroleum will, of course, also be much affected by the production of crude oil in this country.

If production should increase faster than the domestic demand for refined petroleum products, there would probably be some increase in exports of finished petroleum products, and possibly also in exports of crude petroleum, notwithstanding the fact that the competition of foreign petroleum-producing countries in world markets is likely to be stronger than before the war. There would also be a tendency to reduce the imports of crude petroleum below even the relatively small figures of 1939. Conversely, if domestic production should fail to keep pace with domestic demand for refined petroleum products, there would be a simultaneous tendency to reduce the exports of finished petroleum products, and still more those of crude oil, and to increase the imports of crude petroleum.

The production of crude petroleum in foreign countries apparently will be materially greater after the war than before the war. New producing areas have recently been discovered and further discoveries seem highly probable, since in few parts of the world has exploration for petroleum been as extensive as in the United States. Because of the abundant foreign supplies, the United States is not likely to have serious difficulty, at least for a long time to come, in obtaining the crude petroleum necessary to meet its requirements for finished petroleum products, even if domestic production of crude petroleum should fail to keep pace with those requirements.

Influence of imports on domestic production.

The relation between domestic production and imports of crude petroleum is not, of course, determined solely by the degree to which domestic production is able to meet domestic requirements for the refined products. Imports may affect production. A relative lowering of foreign costs, as compared with domestic costs, would tend (subject to possible modifying influence of international corporate relationships) to cause United States imports (crude or refined) to increase, and United States exports to decrease, either of which would tend to cut into the domestic production of crude.

Moreover, changes in the rate of duty on crude petroleum may affect imports, and thus affect domestic production. Imports would tend to be larger if the rate should remain at the present reduced level of 10½ cents per barrel, than if it should revert to the 1939 rate of 21 cents. Conversely, the imports would tend to be less if the tax should be raised to 50 percent above the 1939 rate. It seems impossible, however, to give any numerical statement of the probable magnitude of these effects, particularly in view of the circumstances, other than tariff rates, which have been mentioned above as influencing the international trade in petroleum products.

Estimated domestic consumption of petroleum derivatives in the post-war short-term period.

The following paragraphs contain estimates of the probable consumption of refined petroleum products, as a group, in the United States during the immediate post-war period and the longer term post-war period. These quantities are assumed to represent the consumption of crude petroleum for domestic purposes, apart from consumption in production of export oils.

The demand for refined petroleum products in the United States during the second and third years after the war seems likely to be 10 to 20 percent above the 1939 level. The chief factor working

against a larger increase in consumption, notwithstanding a probably high national income, will be the limited supply of consuming equipment, especially automobiles and household oil burners. New automobiles will probably not be produced in numbers equal to demands for some little time after the war. Meanwhile, as during the war, great numbers of cars will have to be scrapped or put out of commission because replacements are not available. For oil burners, conditions are likely to be more favorable because less equipment has been scrapped and replacements may be more quickly available.

The equivalent of an increase of a 10-20 percent in domestic consumption of refined petroleum would represent a quantity of crude oil and natural gasoline of 1,330-1,450 million barrels.

Estimated domestic consumption of petroleum derivatives in the post-war long-term period.

Per capita income at 1939 level.—The upward trend in the per capita consumption of refined petroleum products in the United States, which began before 1920, seems likely to continue after the war. In view also of a 10-percent increase in population, consumption of these products might be 20 to 35 percent greater than in 1939, when it was 1,210 million barrels (including natural gasoline). This consumption may be expressed in terms of figures as the equivalent of 1,450-1,630 million barrels. Since the prices of crude petroleum are likely to be higher than before the war, even with no increase in per capita national income and no change in the general level of prices, the value of such a quantity would probably be in the neighborhood of 1,850-2,075 million dollars.

Per capita income 75 percent higher than in 1939.—Experience has shown that changes in national income affect the consumption of petroleum products in the United States only moderately. A 75-percent increase in per capita income, however, would probably be reflected in appreciably larger consumption per capita than would occur with income at the 1939 level. Consumption of petroleum products might thus become 30-45 percent greater than in 1939, representing 1,575-1,750 million barrels of crude petroleum and natural gasoline.¹ Prices would probably be even somewhat higher than with national income at 1939 levels, so that the value of this quantity might be in the range of 2,250-2,500 million dollars.

Imports for refining in bond.

The statistics given in the table at the beginning of this section regarding imports of crude petroleum relate only to imports for consumption. In addition to these imports, there were in 1939 relatively small imports (5.5 million barrels) of crude petroleum which entered into bonded refineries, without payment of tax, the derivative products being exported.

If conditions should arise in which domestic production of crude petroleum would be insufficient both to supply the domestic demand for refined products and to maintain a large export trade, it would theoretically be possible to keep up the export trade by larger importation of crude petroleum for refining in bond. This, of course, would be practicable on a large scale only if the cost of refining in the United States were enough below the cost of refining in foreign coun-

¹ Various officials of large oil companies have estimated demand in the post-war period at figures considerably higher than these.

tries to offset the additional expense of transportation involved in the hauling of both crude oil and its refined products. Several factors seem to militate against a large increase in this practice of refining in bond. They include: a probable great increase in production of crude petroleum in the Middle East, the output of which, for geographic reasons, would not be likely to come to the United States for refining and reexport; expansion of refining in the principal foreign petroleum-producing countries, to which expansion United States capital may contribute to a considerable extent; and possible further expansion of the pre-war practice on the part of various deficit countries in giving preference to imports of crude petroleum over those of finished products.

EMPLOYMENT

The total number of persons employed in drilling oil wells and producing crude oil and natural gasoline was approximately 200,000 in 1939. Employment in the post-war period will probably be more or less proportionate to the volume of production.

ILLUSTRATIONS OF RELATION BETWEEN CONSUMPTION, PRODUCTION, EXPORTS, AND IMPORTS

The direction of the effects of the complex causal relations affecting production of and trade in crude petroleum which have been described may be made clearer by certain hypothetical illustrations, which are not intended as forecasts.

In the pre-war period the petroleum position of the United States, expressed in very much rounded figures, was somewhat as follows:

Requirements:	Item	Million barrels
	Domestic consumption of refined petroleum products.....	1, 200
	Exports of crude and refined oil, principally refined.....	150
	Total	1, 350
Supply:		
	Domestic production (including natural gasoline).....	1, 300
	Imports of crude and refined, mainly crude.....	50
	Total	1, 350

In the post-war period consumption of refined petroleum products in the United States will doubtless be materially larger than before the war, the extent of the increase depending partly on the height of the national income. For convenience it is assumed in each of the following hypothetical illustrations that the increase in consumption is 25 percent.

The first illustration is based on two assumptions, namely (a) that the consumption demand in foreign countries in the post-war period increases in the same proportion (25 percent) as that in the United States, and (b) that both the relative costs of production, and the relative ability to supply the market, of the United States and of foreign producing countries remain the same as before the war. Under these assumptions it would be expected that each of the foregoing figures, as representing the pre-war period, would be increased by about 25 percent. No tabulation need be presented to show the resulting quantities.

The second of the two assumptions last mentioned, however, might not correspond with actual facts in the post-war period. The situation might differ, to the disadvantage of the United States, from that assumed, in two ways: (1) Even though the United States might still have adequate productive capacity to supply all domestic requirements and also a large quantity of exports, the relative costs of production might change in favor of foreign countries; (2) the productive capacity of the United States might not expand in proportion to the increase in demand in this country, whereas the capacity of foreign countries might increase much more. The results might then be as shown in the tabulations below.

Taking up the first of the two possibilities just mentioned, independently of the second, a relative improvement in the cost position of foreign producing countries would tend both to increase imports into the United States and to decrease its exports. The effect on exports would probably be greater than that on imports. Assuming no change in the United States revenue tax, the figures in the foregoing tabulation would change in the directions indicated below (this is not intended as a forecast but merely as an illustration):

Requirements:	<i>Item</i>	<i>Million barrels</i>
	Domestic consumption of refined petroleum products (pre-war figure increased by 25 percent)-----	1, 500
	Exports of crude and refined oil, principally refined (pre-war figure reduced by one-third)-----	100
	Total-----	<u>1, 600</u>
Supply:		
	Imports (100-percent increase over pre-war, partly due to increased U. S. requirements and partly to displacement of domestic crude)-----	100
	Domestic production (an increase of 15 percent over pre-war)-----	1, 500
	Total-----	<u>1, 600</u>

Of course, the reverse of the situation illustrated in the second tabulation of the petroleum position of the United States might arise: there might be a relative improvement in the cost position of the United States as compared with foreign countries. It is unnecessary to tabulate the obvious effects of such a change.

The second hypothesis mentioned above, that United States productive capacity may not increase as rapidly as requirements, would have certain effects independent of any change in relative costs of production as between this country and foreign countries. The extent of the modification in the balance sheet of requirements and supply would, of course, depend primarily on the magnitude of the figure of available supplies of domestic petroleum. If the relative cost situation should remain unchanged, these effects would be in the directions indicated below:

Requirements:	<i>Item</i>	<i>Million barrels</i>
	Domestic consumption of refined petroleum products-----	1, 500
	Exports (reduced materially by reason of inadequate domestic supplies, say 50 percent below pre-war figure)-----	75
	Total-----	<u>1, 575</u>
Assumed supply:		
	Assumed domestic production (about 10 percent over pre-war)-----	1, 425
	Balance which would have to be supplied by imports (three times pre-war)-----	150
	Total-----	<u>1, 575</u>

Obviously, if the reverse of the above situation should arise, relative supplies available in the United States increasing instead of decreasing, changes in exports and imports would be in directions opposite to those illustrated.

If in addition to the effects of inadequate supplies of crude petroleum in the United States illustrated in the foregoing tabulation, the competitive position of foreign producers should be strengthened by a relative lowering of costs, the domestic production, even though capacity existed to supply the quantity specified in that tabulation, would presumably not in fact reach that figure. The foreign producers would probably take a larger share both of the domestic and the export market. The effects illustrated in the second and third tabulations would become cumulative. The results (hypothetical and not intended as a forecast) might be somewhat as follows:

Requirements:	<i>Item</i>	<i>Million barrels</i>
	Domestic consumption of refined petroleum products.....	1, 500
	Exports of crude and refined oil, principally refined (one-third of pre-war figure).....	50
	Total.....	1, 550
Supply:		
	Imports of crude and refined, mainly crude (four times pre-war)....	200
	Balance remaining for domestic producers (4 percent above pre-war)...	1, 350
	Total.....	1, 550

Again, if the reverse situation should arise, with the United States gaining in position both with respect to supplies available and costs, the exports might become very much larger, and the imports very much smaller, than those illustrated.

The hypothetical illustrations of the petroleum situation of the United States in the second, third, and fourth tabulations are based on the assumption that the import tax on crude petroleum in the post-war period will be the same as in 1939 (which was double the rate now in effect). If the 1939 rate should be reduced by 50 percent or increased by 50 percent, there might be considerable change in the relation between imports and domestic production shown in each of these tabulations (see subsection above regarding influence of imports on domestic production).

GASOLINE AND NAPHTHA

<i>Tariff paragraph</i>	<i>Commodity</i>	<i>Rate of duty</i>	<i>Equivalent ad valorem (1939)</i>
1733	Gasoline, naphtha, and finished light products:		
	Gasoline.....	\$1.05 per bbl.	31%
	Naphtha, etc.....	21¢ per bbl.	6%

NOTE.—No duty was imposed by the Tariff Act of 1930. The Revenue Act of 1932 imposed an import-exercise tax (collected as a duty) of \$1.05 per barrel on gasoline and 21 cents per barrel on naphtha, etc., which became effective June 21, 1932.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 barrels).....	611, 043	42, 188	568, 855	1 49	568, 904	Percent 0. 01
Value (\$1,000).....	1, 497, 055	110, 725	1, 386, 330	‡ 167		
Unit value (per barrel).....	\$2. 45	\$2. 62	\$2. 44	\$3. 38		
Persons employed (number).....	‡ 100, 000					

¹ Not including imports (relatively small) for further manufacture in bond and for export. Imports shown consist chiefly of naphtha and finished light products having an average unit value higher than that of gasoline.

² Foreign value.

³ Total for refining industry.

Changes in national income or in rates of duty may have effects on imports of gasoline that are different from the effects on imports of crude petroleum. The revenue tax on gasoline is much higher per gallon than the tax on crude oil. If domestic refiners lack sufficient supplies of crude petroleum to meet requirements for gasoline, they can import crude petroleum.

The possibility of imports of gasoline depends primarily on the relation between the cost of transforming crude petroleum into gasoline in this country and the corresponding cost in other countries (especially those which themselves produce crude petroleum) plus the duty. It may also be affected by international corporate relationships (see section on crude petroleum). Imports of gasoline have been insignificant since the imposition of the duty in 1932, whereas those of crude petroleum have been quite large.

POST-WAR SHORT TERM

Consumption of gasoline immediately after the war will probably be only moderately, perhaps 10 to 15 percent, larger than in 1939 (naphtha is of negligible importance as a separate commodity); notwithstanding probably high national income. The controlling factor in consumption will probably be the number and condition of automobiles in operation. During the war several million cars will have been scrapped. Of those that survive, many will be in poor condition because of age, with complications resulting from subnormal maintenance. Output of new cars may not be sufficient to fill the demand for replacements and additions for 2 or 3 years after the end of the war. Obviously, the longer the war lasts, the larger will be the temporary shortage of cars. On the other hand, when wartime restrictions are removed, consumption of gasoline per car for cars actually in operation may be somewhat higher than in 1939. Production of gasoline, whether from domestic or imported crude oil, will no doubt be sufficient to take care of the moderately increased demand and to leave an excess for exports. Imports will probably continue to be negligible, if the duty remains unchanged.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of gasoline, taking into account increased population, may possibly total 750–800 million barrels annually, or 30–40 percent more than in 1939. This estimate is based on the trend during 1920–40 when gasoline consumption increased much more rapidly than population and largely irrespective of changes in per capita income. Continuing improvements in both automobiles and gasoline, which may result in increased efficiency in terms of mileage per gallon, seem likely to be more than offset by increases in the number of vehicles and greater mileage per vehicle per year; increase in use of airplanes will also affect the consumption of gasoline. The price of crude oil seems likely to be higher than in 1939 and to be reflected in higher prices for all petroleum products, perhaps 20–30 percent higher. In that case the value of consumption would be 2.2–2.6 billion dollars. Production, from domestic and imported crude oil, will almost certainly be sufficient to supply the consumption. Total production will depend on the magnitude of exports (see below).

A 50-percent reduction in the rate of duty on gasoline would probably not result in any material increase in imports, assuming that the duty on crude petroleum would also be reduced (i. e., below the 1939 level; it has already been so reduced). An increase in the duty, of course, would keep imports at or below the small pre-war figures.

Per capita income 75 percent higher than in 1939.

In the light of past experience, the large increase in per capita income may be reflected in only a moderate increase in per capita consumption of gasoline. Consumption might, however, be 15–20 percent larger than with unchanged income, and in the neighborhood of 850–900 million barrels a year, or 50–60 percent more than in 1939. In conformity with the assumed high level of prices (probably somewhat higher than with unchanged income) the value of the increased volume of gasoline consumed might be 2.6–3.0 billion dollars. Imports of gasoline would probably continue negligible, if the duty were reduced by 50 percent (assuming no change in the already reduced duty on crude). Production at United States refineries whether from domestic or imported crude would be sufficient to supply the entire consumption. Total production would also be affected by the volume of exports.

Exports

The magnitude of the exports of gasoline after the war will be greatly affected by the relation between domestic production of crude petroleum and domestic consumption of refined petroleum products. See the section on crude petroleum.

Employment

The petroleum-refining industry produces a number of commodities simultaneously from a single raw material. The number of workers depends primarily on the quantity of crude oil processed, not on the output of any one product such as gasoline.

In 1939, about 100,000 persons were employed at United States petroleum refineries. It seems likely that the number of employees will increase at approximately the same rate as the volume of crude refined and may therefore reach 130,000. Although some processing methods have become more complex during the war, there has been also a considerable advance in the use of automatic-control equipment. Therefore, the more complicated processing will probably not require any marked change in the number of employees per unit of volume.

FUEL OILS

Tariff paragraph: 1733.

Commodity: Gas oil and distillate fuel oil, residual fuel oil, unfinished oils, and topped crude.

Rate of duty: 21¢ per bbl.

Equivalent ad valorem (1939): 11% to 27% (average 24%).

NOTE.—This commodity was free of duty under the Tariff Act of 1930. The Revenue Act of 1932 imposed an import-excise tax (to be collected as a duty) of 21 cents per barrel, which became effective June 21, 1932. The rate was reduced to 10½ cents, effective December 16, 1939, under a tariff-quota regime, pursuant to the trade agreement with Venezuela. The quota regime was abolished, effective January 30, 1943, pursuant to the agreement with Mexico.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports ²	Apparent consumption	Ratio of imports to consumption
	Total	For export ¹	For domestic market			
Quantity (million barrels).....	467.7	45.6	422.1	8.2	430.3	Percent 1.9
Value (million dollars).....	465.6	54.4	411.2	³ 6.4	-----	-----
Unit value (per barrel).....	\$1.00	\$1.19	\$0.97	\$0.80	-----	-----

¹ Not including bunker oil loaded on vessels in foreign trade, 37 million barrels in 1939; this is included in apparent domestic consumption.

² Not including oils imported for further treatment in bond with exportation of the products, nor for the supply of vessels (both duty-free); such imports in 1939 were 19 million barrels.

³ Foreign value.

This group comprises distillate fuel oil, residual fuel oil, unfinished oils, and topped crude. Distillate fuel oil, also known as gas oil, includes Diesel oil and household fuel oil. Residual fuel oil includes heavy fuels for heating and for industrial plants, railway locomotives, and ships. Unfinished oils and topped crude, which are mainly fuel oils intended for further processing, are distinguished from fuel oils only in statistics of imports. Imports are mainly from Netherlands West Indies (derived chiefly from Venezuelan crude oil).

If domestic refiners lack sufficient supplies of crude petroleum to meet requirements for fuel oil, they can import crude, so that imports of fuel oil need not necessarily increase. However, the rate of duty on fuel oil is the same as that on the crude oil, so that the possibility of imports of fuel oil depends largely on the relation between the cost of refining crude in this country and in other countries, especially those which themselves produce crude petroleum. Other factors affecting imports are intercorporate relationships of domestic and

foreign producers (see section on crude petroleum), and differences in grade as between the crude oils produced in this country and those produced in Latin-American countries.

POST-WAR SHORT TERM

The probabilities seem to be that consumption of fuel oils during the immediate post-war years will be approximately 20-25 percent larger than in 1939, or 500-550 million barrels. It seems likely that the strong upward trend of recent years in the use of light fuel oils for household heating will continue, and will be accentuated by the higher national income.

The duty on imported fuel oils was reduced 50 percent in December 1939. In January 1943 the reduction, which had been limited previously by a quota provision, became applicable to all imports regardless of quantity. Imports totaled 8 million barrels in 1939, 28 million in 1940, and 30 million in 1941; but this wartime increase has little bearing on post-war prospects. Because of wartime shipping conditions, imports decreased to 11 million barrels in 1942 and to 4 million in 1943. Immediately after the war it seems likely that the volume of imports will greatly exceed the 1939 quantity, if the reduction in the duty made in December 1939 remains in effect.

POST-WAR LONG TERM

Consumption, Production, and Imports

The consumption of light fuel oils has increased rapidly in the last decade, chiefly because of the great convenience of the household oil burner, and in spite of the fact that in most sections of the country coal was a cheaper fuel. This circumstance is likely to continue to be of importance, even though automatic coal stokers for household use will hereafter offer more competition to the oil burner.

Consumption of heavy fuel oils in industrial plants and transportation is more sensitive to price competition from coal. If the prices of coal remain low after World War II, as they did after World War I, while crude oil increases in price, consumption of heavy fuel oil is not likely to increase substantially, even with a high national income.

By the use of new processes which permit the breaking up and reforming of the various molecules it is possible to increase the yield of gasoline and decrease the yield of fuel oils from a given quantity of crude petroleum. To a less extent, therefore, will it be possible for fuel oils to be abundant and cheap while gasoline is scarce and rising in prices. Consequently, fuel oils will probably form a relatively smaller proportion of petroleum products derived from United States crude petroleum. This fact may tend to cause larger imports of fuel oil derived from the heavy crudes of Venezuela and Mexico, or of the crude oils themselves.

Per capita income at 1939 level.

Consumption of fuel oils, taking account of growth of population and general upward trend, may possibly increase to a volume of 535-580 million barrels a year, or from 25 to 35 percent more than in

1939. Most of the increase would probably be in the distillate grades (chiefly used in household oil burners) in continuation of the pre-war trend. If prices of petroleum products should rise relative to the general price level, it seems likely that the use of residual fuel oil in industry would be restricted to some extent by competition with coal. If the price of crude oil rises, as seems likely, there would probably be an approximately corresponding rise in the unit value of fuel oil. The total value of consumption might be 650-750 million dollars.

If the duty should be the same as in 1939, imports (for consumption and exclusive of imports for use of vessels) might be, as in 1939, about 2 percent of consumption, or, say, 10-12 million barrels, with a foreign value of perhaps \$1 per barrel. With a 50-percent reduction in the 1939 duty (already now in effect), imports might possibly reach 20-25 million barrels, and with a 50-percent increase in duty they might fall to about 5-6 million barrels.

Domestic production of fuel oil (including production from foreign crude, if any), besides supplying most of the consumption, would presumably provide some exports (see subsection on exports below).

Per capita income 75 percent higher than in 1939.

Consumption of fuel oils would probably be appreciably higher per capita than with unchanged income, and might possibly reach a level of 575-625 million barrels annually, with a value of 700-800 million dollars. Most of the increase would probably be accounted for by household heating oil; it does not seem likely that the increase in per capita income would result in any material increase in consumption of the heavy residual oils. Imports of fuel oils might supply 1-5 percent of the consumption or even more, depending on the rate of duty, on the policy of domestic refiners as to the relative production of fuel oil and of gasoline from domestic crude, on the volume of imports of crude petroleum, and on still other factors. Imports might then total, say, 6-30 million barrels, with a foreign value of 7.5-37.5 million dollars, at \$1.25 per barrel. The quantity produced would depend in part on the quantity imported and exported (see below).

Exports

The magnitude of post-war exports may be much affected by the then existing relation between domestic production of crude petroleum and domestic demand for refined petroleum products, a subject which is discussed in the section on crude petroleum.

Employment

(See section on Gasoline.)

PARAFFIN WAX

Tariff paragraph: 1733.

Commodity: Paraffin and paraffin wax.

Rate of duty: Free (but subject to an import excise tax of 1¢ per lb.). *Equivalent ad valorem (1939):* 38%.

NOTE.—No duty was imposed by the Tariff Act of 1930, but an import excise tax of 1 cent per pound was imposed by the Revenue Act of 1932, effective June 21, 1932.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	465	233	232	38	270	Percent 14
Value (\$1,000).....	14,981	7,861	7,120	1,001		
Unit value (per pound).....	\$0.032	\$0.034	\$0.031	\$0.026		

¹ As to actual consumption, see text.

² Foreign value.

Paraffin wax, one of the minor products of crude petroleum, finds its principal use in the manufacture of waxed papers and food containers. Other important uses are in electrical equipment and, after chlorination, in treating fabrics to increase resistance to fire, moisture, and mildew. Other waxes and synthetic products may be substituted for paraffin wax in most of these uses. In 1939 apparent consumption was 270 million pounds. Taking account of the decline of stocks during the year, actual consumption was about 325 million pounds, which is a more appropriate basis for estimating post-war consumption.

Paraffin wax is produced as a byproduct of the processing of lubricating oils; the volume of its production depends chiefly on the output of such oils. United States production has greatly exceeded consumption, large amounts being exported.

Despite our large exports of paraffin wax, the United States has imported substantial quantities in pre-war years. These imports originated almost wholly from refineries in the Netherlands Indies.

POST-WAR SHORT TERM

The demand for lubricating oils, at home and for export, will probably be strong in the years immediately after the war. United States production of paraffin wax may, therefore, be about 25 percent higher than in 1939. Consumption may be about the same as in 1939 (actual not apparent).

Imports are likely to be small, because of probable delays in reaching normal production in the Netherlands Indies. Even so, the surplus available in the United States should allow exports at about the same rate as 1939, or larger.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

There has been no definite trend in the per capita consumption of paraffin wax, but, by reason of growth of population, consumption might be 340-375 million pounds, or 5-15 percent more than the

actual (as distinguished from apparent) consumption in 1939 (325 million pounds). Production of paraffin wax under these conditions cannot be closely estimated. It would depend, on the one hand, on the domestic production of lubricating oils from crude petroleum of paraffin or mixed paraffin-asphalt base, and the proportion of the paraffin extracted in the joint process; on the other, it would depend on the magnitude of exports, which have been a very large proportion of production in the past, as well as the magnitude of imports, which have been relatively small in the past.

There is little reason to suppose that consumption in foreign countries will increase materially. Exports will, therefore, depend chiefly on the degree of competition encountered in foreign markets. The principal production of paraffin wax outside of the United States is in the Netherlands Indies, where the crude oil has a very high paraffin content, whereas the crude produced in most other foreign countries has an asphalt base. It is obviously impracticable to forecast for a decade or more the production of crude oil, and consequently of paraffin wax, in the Netherlands Indies. Exports of paraffin wax from the United States consequently may, on the one hand, be as large as, or even larger than, before the war, or may, on the other hand, be appreciably smaller than before, by reason of increased competition from the Netherlands Indies. They might be 200-250 million pounds, with a value, at 1939 prices, of 7.0-8.5 million dollars.

Imports will also depend largely on the conditions of production in the Netherlands Indies. They might be considerably smaller or considerably larger than in 1939, say, 30-50 million pounds, with a foreign value \$800,000-\$1,300,000, at the 1939 unit values.

The production of paraffin wax in conjunction with the production of lubricating oils is to some extent optional, so that the domestic output will depend primarily on how much can be marketed profitably at home and abroad. Under the uncertainties regarding imports, and still more so those regarding exports, total United States production might range rather widely, from, say, 490-600 million pounds (nearly one-third more than it was in 1939). United States production for the domestic market might be about 290-345 million pounds valued at from 9-10.7 million dollars, at 1939 prices.

Per capita income 75 percent higher than in 1939.

In the past, consumption of paraffin wax in the United States has not been materially influenced by changes in per capita income. Consumption with a higher income level might, therefore, still be 340-375 million pounds. All that has been said in the foregoing paragraphs about the quantities of exports and imports, and the resulting figures for domestic production, would apply also under this assumption as to national income, particularly since there is little reason to suppose that the foreign demand for paraffin wax would increase materially with increased income abroad. It may be assumed, however, that, with higher national income in the United States and in foreign countries, prices, domestic and foreign, of paraffin wax would be somewhat higher than before the war.

Accepting the quantities presented in the preceding subsection as possibly representative also for conditions with a higher national

income, the figures for consumption, exports, imports, and production, under the second assumption, might be somewhat as follows:

Item	Production			Imports	Appar-ent con-sumption
	Total	For export	For domestic market		
Quantity (million pounds)	490-600	200-250	290-345	30-50	340-375
Value (million dollars)	20.0-24.0	8-10.0	12.0-14.0	0.9-1.5	-----
Unit value (cents per pound)	4.0	4.0	4.0	3.0	-----

Effect of changes in tax.

Although the revenue tax of 1 cent per pound was equivalent to 38 percent ad valorem in 1939, it seems unlikely that an increase or a decrease of the tax by 50 percent would have a very important effect on imports. The fact that exports are several times greater than imports suggests that the imports may be the result of special conditions. Imports of paraffin wax have been larger since the tax was imposed than theretofore. It is, of course, probable that a marked change in the tax would have some effect on imports but a reduction of 50 percent might result in an increase no greater than 10 percent in the volume of imports, and an increase of 50 percent might not reduce imports by more than 10 percent.

Exports

Exports of paraffin wax may decrease somewhat below the 1939 level because of increased foreign competition. It is believed, however, that the chief factor in the future, as in the past, will be the exportable surplus of production over domestic consumption, which will depend on the production of lubricating oils.

Employment

The petroleum-refining industry produces a number of commodities simultaneously from a single raw material. The number of workers depends primarily on the quantity of crude oil processed and the production of a single minor product such as paraffin has little effect on the number employed.

WHITE MINERAL OIL

Tariff paragraph: 1733.

Commodity: Mineral oil, medicinal.

Rate of duty: Free (but subject to import-exercise tax of $\frac{1}{4}$ ¢ per gal.) *Equivalent ad valorem (1939):* 0.8%.

NOTE.—No duty was imposed by the Tariff Act of 1930, but an import-exercise tax of $\frac{1}{4}$ ¢ per gallon was imposed by the Revenue Act of 1932, effective June 21, 1932.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 gallons).....	8,064	1,606	6,458	806	7,304	Percent
Value (\$1,000).....	3,226	709	2,517	492		11
Unit value (per gallon).....	\$0.40	\$0.43	\$0.39	\$0.61		
Persons employed (number).....	200					

- 1 Estimated.
 2 Foreign value.
 3 Less than 200.

White mineral oil, a very minor product of crude petroleum, is a lubricating oil so highly refined as to be virtually colorless, tasteless, and odorless. It is used medicinally as an intestinal lubricant, and industrially by bakers, confectioners, and manufacturers of salves and ointments.

United States production of lubricating oil is so large in comparison with any possible consumption of white mineral oil that it is safe to say there is no technical limitation on its production in any volume desired. United States production of white mineral oil is classified as medicinal by the Bureau of Mines; but only part of it is used in human medicine, and there is reason to believe that not all of it is strictly of medicinal grade.

The principal foreign suppliers of white mineral oil have been Germany and Belgium. The relatively high unit value of imports is probably due to the fact that imports consist almost entirely of strictly medicinal grades.

United States consumption of white mineral oil increased during the 12 years, 1928-39, at a more rapid rate than did the population; this increase was largely independent of changes in national income.

POST-WAR SHORT TERM

Consumption will probably be slightly larger immediately after the war than in 1939, in line with the anticipated increase in population.

Imports will probably be negligible. Even if production in Europe can be resumed within the period, the entire output will probably be consumed locally.

POST-WAR LONG TERM

Consumption, Production, and Imports

The duty on white mineral oil is so low in relation to the value of the product that either a 50-percent increase or decrease is not likely to have any appreciable effect upon imports. United States production will be adequate for all needs at competitive prices. Consequently, although it is assumed that European production will be resumed, the volume of imports is likely to depend on the extent to which former trade channels will be reestablished.

Per capita income at 1939 level.

Consumption may be in the neighborhood of 8.6 million gallons, or 20 percent more than in 1939. Production for the domestic market will probably amount to about 8.1 million gallons, an increase of about 25 percent over 1939. If, as seems likely, the price of white mineral oil rises, the value of this production may be about 4 million dollars, at 50 cents per gallon. Imports are likely to supply about 6 percent of domestic consumption, or approximately 500,000 gallons, with a foreign value of \$350,000, at 70 cents per gallon.

Per capita income 75 percent higher than in 1939.

In the light of pre-war experience, it is believed that the volume of consumption would not be noticeably affected by an increase of 75 percent in per capita income. However, unit values would probably be somewhat higher. Therefore, consumption is estimated at about 8.6 million gallons, and production for the domestic market at about 8.1 million gallons, with a value of approximately 5 million dollars, at 60 cents per gallon.

Imports may supply about 6 percent of consumption and amount to about 500,000 gallons, with a foreign value of \$400,000, at 80 cents per gallon.

Exports

Exports of white mineral oil will probably continue in substantial volume, as in the immediate pre-war years. They may increase to 2 million gallons annually, or 20 percent more than in 1939.

Employment

Only a few petroleum refineries produce white mineral oil. The number of employees is very small, perhaps 100 to 200, and is not likely to increase.

LICORICE ROOT

Tariff paragraph: 1602.
Commodity: Crude licorice root.
Rate of duty: Free.

GENERAL

Data on United States imports less reexports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	62, 331
Value (\$1,000).....	1, 131
Unit value (per pound).....	\$0. 022

Licorice root is the natural root from which the flavor of licorice, in the form of extract or paste, is obtained. It is not grown on a commercial scale in the United States. United States imports of crude licorice root have come principally from Turkey, Soviet Union, and Iraq, in that order.

Licorice root yields not only the flavor but, as much less important byproducts, a liquid used in fire-fighting apparatus and the root fiber for wallboard or fuel. Licorice extract or paste is sold principally to the tobacco industry, and, to a minor extent, to the confectionery and drug industries. The United States consumption of flavor and

therefore of root has declined in recent years chiefly because of declining use of snuff and chewing tobacco. Cigarette tobacco uses much smaller amounts of licorice flavor.

POST-WAR SHORT TERM

By reason of the downward trend, the consumption of licorice root, during the first few years following the war, will probably remain at about the 1939 level. Imports will probably be fairly large because the two processors will probably build up their stocks, of which they usually keep about 2 years' supply.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

A 10-percent increase in population and an increased consumption of cigarettes would probably not be sufficient to increase consumption over the 1939 level, because of the over-all downward trend in domestic consumption of licorice. Imports of about 62 million pounds, with a foreign value of about 1.4 million dollars may therefore be expected.

Per capita income 75 percent higher than in 1939.

With a 75-percent increase in per capita income and a 10-percent increase in population, consumption of licorice root might increase somewhat over 1939 levels, or to about 65 million pounds annually. With a unit value of about 2.4 cents per pound, this would amount to about 1.5 million dollars (foreign value).

Exports

Exports of crude licorice root have probably been negligible. Exports of licorice extract or paste have averaged about 2½ million pounds annually.

CRUDE TARTAR MATERIALS

Tariff paragraph: 1611.

Commodity: Argols, tartars, wine lees, and calcium tartrate, crude.

Rate of duty: Free.

NOTE.—Argols, tartar, and wine lees containing 90 percent or more of potassium bitartrate are dutiable at 5 cents per pound, but none have been imported since 1930.

GENERAL

Data on United States imports less reexports (apparent consumption)¹ for 1939 are given below:

Quantity (1,000 pounds).....	20, 665
Value (\$1,000).....	1, 428
Unit value (per pound).....	\$0. 07

¹ Foreign value.

¹ In addition, a small amount of argols and wine lees are obtained from domestic sources, figures for which are unavailable.

Argols and wine lees are the deposits and settlings formed in casks during the fermentation of wine. Argols usually contain 60 to 85 percent potassium bitartrate and wine lees 25 to 40 percent. Argols and wine lees contain calcium tartrate, and additional quantities are produced when low-grade wine lees are treated with a lime salt to prevent deterioration and to facilitate shipment. Argols and wine lees are raw materials for the production of tartaric acid, cream of tartar, Rochelle salt, and tartar emetic. Calcium tartrate is a raw material for the production of tartaric acid.

The bulk of the products made from crude tartars are used in food products, soft drinks, baking powder, and pharmaceuticals. Relatively small quantities are used for industrial purposes.

United States production of crude tartar materials is quite small. Tartar raw materials have come principally from the important wine-producing countries bordering the Mediterranean, especially from France, Italy, Portugal, Spain, Algeria, and Tunisia. Argentina has also been a source of supply. Imports in 1939 were somewhat lower than average; imports averaged 28 million pounds in the 4 years 1937-40.

POST-WAR SHORT TERM

The supply of crude tartar materials after the war will depend largely on the speed with which the countries bordering the Mediterranean Sea resume their more or less normal activities and upon the price at which the crude tartars are offered. It is probable that about as much will be available shortly after the war as during pre-war years. There is likely to be a fairly strong demand for tartar products in the United States despite competition from other products such as citric acid.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

At the 1939 income level, consumption of crude tartars would probably be of about the same magnitude as in the years immediately preceding the war—that is, about 25-30 million pounds—and practically all would come from foreign sources. The foreign value of imports would probably be 1½-2 million dollars at 1939 prices.

Per capita income 75 percent higher than in 1939.

Consumption of crude tartars might be 15-25 percent higher than in the immediate pre-war years and amount to 32-35 million pounds. Because of competition with other products and because the supply of tartar raw materials is limited, the increase in consumption at higher income levels would not be in proportion to increased purchasing power. Assuming a 10- to 15-percent increase in price levels, the foreign value of imports might be about 2½-3 million dollars.

WHITE ARSENIC

Tariff paragraph: 1614.
 Commodity: Arsenious acid or white arsenic.
 Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (short tons).....	22,341	3.2	22,338	14,674	37,012	Percent 40
Value (\$1,000).....	1,494	(9)	494	1,562		
Unit value (per short ton).....	\$22	\$31	\$22	\$36		

- 1 As reported by producers to the Bureau of Mines.
- 2 Partly estimated.
- 3 Amounts to about \$100
- 4 Foreign value.
- 5 Value at plant.

Before World War II, United States consumption of white arsenic ranged between 25,000 and 38,000 short tons a year, about half of which came from domestic production and half from imports. About half the imports were supplied by Mexico; and Sweden, France, Belgium, and Canada supplied the remainder.

About one-third of the white arsenic consumed was used directly as a weed killer, one-half in the manufacture of agricultural insecticides, and the remainder in the manufacture of glass, wood preservatives, dyes, enamels, pharmaceuticals, and metallic arsenic. During the war, increased amounts are being used in insecticides and in the manufacture of arsenic trichloride, which is used in the manufacture of chemical warfare gases.

White arsenic, also known as arsenious acid or arsenic trioxide, is recovered in most countries from byproduct flue dust resulting from the smelting of metallic ores, principally gold, copper, and lead, which contain small percentages of arsenic. Consequently, the output of arsenic is largely dependent on the rate of operations in gold, copper, and lead. The low price of white arsenic normally prevents the profitable smelting of ores primarily for arsenic. During the war, however, the United States Government subsidized production from domestic arsenic-bearing minerals to augment the supply of white arsenic.

World production of white arsenic has usually been in excess of world consumption, and large stock piles of white arsenic are common in normal times, especially in Sweden, where the arsenic content of the ores processed is very high. As a result, Sweden produces about half the world's supply of white arsenic. It is reported that Swedish stocks were 250,000 metric tons in 1936 and are now in excess of 350,000 metric tons.

POST-WAR SHORT TERM

During the war, consumption of white arsenic has been about 40,000-50,000 short tons and this consumption will probably be maintained in the first few years after the war. This is about 20 percent above the 1939 level of consumption. The extent to which consumption will be supplied by imports will depend to a large degree upon

the cost of ocean transport and on whether Sweden decides to sell its accumulated stocks at very low prices.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

With decrease of the per capita income to the 1939 level, consumption of white arsenic will probably return to about the level of that year and amount to about 35,000–40,000 short tons. The large supplies in Sweden may tend to lower prices and cause imports to supply a larger proportion of domestic consumption. The strength of this tendency will depend on the policy of the Swedish producers.

Per capita income 75 percent higher than in 1939.

A per capita income at this level would tend to sustain the wartime consumption of 40,000–50,000 short tons of white arsenic, since it would be in large demand as a weed killer and in the manufacture of agricultural insecticides. The pressure of world stocks upon price will probably tend to limit domestic production and increase the proportion supplied by imports, the strength of this tendency depending on the policy of the Swedish producers.

Exports

Ordinarily, exports of white arsenic are not large and, in view of the increased world surpluses, are not likely to increase in the long-term post-war period.

Employment

The number of persons employed in the production of white arsenic is small, amounting to less than 100 persons in 1939, and would be affected only slightly by the assumed changes in the national income.

QUININE AND OTHER CINCHONA BARK ALKALOIDS

Tariff paragraph: 1619, 1748.

Commodity: Cinchona bark, its alkaloids and their derivatives.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity:						<i>Percent</i>
Cinchona bark (1,000 lb.).....				2,030	2,030	100
Alkaloids and salts of cinchona bark (1,000 ounces).....	1,923		1,923	3,705	6,628	56
Value (\$1,000):						
Cinchona bark.....				1,857		
Alkaloids and salts of cinchona bark.....	1,754		1,754	1,392		
Unit value:						
Cinchona bark (per lb.).....				\$0.42		
Alkaloids and salts of cinchona bark (per oz.).....	\$0.60		\$0.60	\$0.38		
Persons employed (number).....	(¹)					

¹ Alkaloid derivatives contained in imported Java cinchona bark estimated at 9 percent.

² Foreign value.

³ Estimated.

⁴ Less than 50.

Cinchona bark is obtained principally from several species of trees of the genus *Cinchona*, and is the raw material used for the manufacture of the crystallizable cinchona alkaloids—quinine, quinidine, cinchonine, and cinchonidine. Minor quantities of cinchona bark are used in the production of totaquine, which is a mixture of all the cinchona alkaloids, generally used as a low cost but efficient antimalarial.

Quinine (chiefly in the form of quinine sulfate) is the most important cinchona alkaloid and is used principally as an antimalarial. Before the present war, quinine was also used in considerable quantities in cold medicines and in antipyretics, tonics, antiseptics, and antiperiodics. Cinchonine and cinchonidine may be used for the same purposes as quinine. Quinidine is used principally in treating certain cardiac and neurological disorders; in this use there is no good substitute.

Before 1942, about 80 to 90 percent of the cinchona bark was produced in the Netherlands Indies, and the remaining portion was produced principally in British India and Latin America. There is no cinchona bark produced in the United States. Production in Latin America has increased greatly during the war but even so it is likely to remain a small part of total world production because of higher production costs in gathering the wild bark and lower yields of cinchona alkaloids as compared with the cost of production of the Netherlands Indies plantation bark. Until the Japanese occupation of the Netherlands Indies, world production of cinchona bark, and consequently cinchona alkaloids, was controlled by a cartel known as the Kina Bureau. As long as world production of bark is centered in the Netherlands Indies, production of quinine will probably continue to be controlled from that source.

Synthetic antimalarials, particularly quinacrine hydrochloride (atabrine), compete directly with cinchona alkaloids. United States production of this synthetic drug was tremendously increased to supply the wartime demand for antimalarials, and is now cheaper per dose than quinine. Because of competition from synthetic products, the post-war consumption of quinine as an antimalarial in the United States might drop markedly below the 1939 level, but its consumption in miscellaneous pharmaceutical products such as hair tonics and cold medicines might expand somewhat. Totaquine may also be more important than formerly, as a cheaper antimalarial for self medication, but the quantity available for this purpose will probably be controlled by the cinchona bark producers. The recent development of efficient insect-control agents also may tend to eradicate some of the malarial areas and lessen the need for antimalarial medicines.

POST-WAR SHORT TERM

During the first few years following the war, United States consumption of antimalarials will be likely to increase considerably over the 1939 level because of the development of latent or relapse cases of malaria by persons who contracted the disease during the war. It is also very likely that large quantities of antimalarials will be exported to foreign markets and that larger quantities will be used to treat inhabitants of malarial areas in the United States.

POST-WAR LONG TERM

Consumption, Production, and Imports

The quantity of cinchona alkaloids produced in the United States will depend partly on the accessibility of foreign bark to American producers. In the past United States imports of bark from the Netherlands Indies have rarely exceeded 50 percent of the total of domestic consumption of cinchona alkaloids, the remainder being supplied in the form of finished products imported principally from the Netherlands and the Netherlands Indies. If bark is freely available from Latin America, the amount processed in the United States may exceed the pre-war average.

Per capita income at 1939 level.

Because of competition with the new synthetic antimalarial, consumption of cinchona alkaloids in the United States might possibly total only about 3.3 million ounces annually, or about 50 percent of consumption in 1939.

This consumption might be supplied by imports of about 1 million pounds of cinchona bark, with a foreign value of about \$422,000, at 1939 prices, and imports of about 1.8 million ounces of cinchona alkaloids and salts, with a foreign value of about \$700,000, at 1939 prices. United States production of alkaloids and salts from the imported bark might total about 1.4 million ounces, with a value of about \$840,000, at 1939 prices.

Per capita income 75 percent higher than in 1939.

United States consumption of cinchona alkaloids might amount to about 5 million ounces annually, or about 75 percent of the consumption in 1939. This consumption might be supplied by imports of about 1.5 million pounds of cinchona bark, with a foreign value of about \$712,000, at 47.5 cents a pound, and imports of about 2.7 million ounces of cinchona alkaloids and salts, with a foreign value of about 1.2 million dollars, at 44 cents an ounce. United States production of alkaloids and salts from the imported bark might be about 2.2 million ounces, having a value of about 1.5 million dollars, at 68 cents an ounce.

NITROGENOUS FERTILIZER MATERIALS

Tariff paragraph: 1625, 1641, 1685, 1766, and 1780.

Commodity: Nitrogenous fertilizer materials.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Gross weight (1,000 short tons):						Percent.
Inorganic.....	1,325	197	1,128	1,150	2,278	50
Organic.....	522	14	508	136	646	21
Total.....	1,847	211	1,636	1,286	2,924	44
Value (\$1,000):						
Inorganic.....	33,031	5,601	27,430	1 23,092		
Organic.....	13,563	270	13,313	1 3,237		
Total.....	46,614	5,871	40,743	1 26,329		
Nitrogen content (1,000 short tons):						
Inorganic.....	260	33	227	196	425	47
Organic.....	32	(?)	32	8	40	20
Total.....	292	33	259	206	465	44
Value per ton of nitrogen:						
Inorganic.....	\$127	\$170	\$121	1 \$117		
Organic.....	424	640	416	1 405		
Average.....	160	178	157	1 128		
Persons employed (number).....	1 6,000					

1 Foreign value.

2 Less than 500 short tons.

3 Estimated.

Nitrogenous fertilizer materials are of two types: Inorganic, of which sodium nitrate, ammonium sulfate, and calcium cyanamide are perhaps the most familiar; and organic, such as vegetable-seed meals, animal excrements, and tankage. Of the two, the inorganic is the more important, accounting, in 1939, for about 90 percent of United States production of the two types of nitrogen; 95 percent of imports, and 90 percent of consumption.

Although the inorganic or chemical nitrogen fertilizers are produced and consumed in greater volume than the organic materials, the latter command a considerably higher price per ton of nitrogen. There has been an increasing demand in recent years for these materials (particularly dried blood, animal tankage, and fish scrap and meal) for animal feed purposes. Since organic fertilizers not only supply organic matter to the soil but have the property of absorbing moisture, they are frequently incorporated in mixed fertilizers, where they serve as "conditioners" by preventing the mixture from caking. Consumption of nitrogenous fertilizers has shown an upward trend, which reflects an increase in population, and the continued necessity of replacing the nitrogen in the soil, which is gradually exhausted when it is not adequately restored by animal manure or cover crops.

United States production, imports, and apparent consumption of the principal inorganic and organic nitrogenous fertilizer materials in 1939, in short tons of nitrogen, are shown below:

Nitrogenous fertilizer materials	Nitrogen content	Production			Imports	Apparent consumption	Ratio of imports to consumption
		Total	For export	For domestic market			
Inorganic:	<i>Percent</i>						<i>Percent</i>
Ammonium sulfate.....	20.6	138,076	10,776	127,300	25,262	152,562	16.6
Ammonium phosphates.....	17.0	8,500	4,317	4,183	6,663	10,846	61.4
Calcium cyanide.....	22.0	None			32,697	32,697	100.0
Sodium nitrate.....	16.0	170,000		70,000	108,307	178,307	60.7
All other.....		43,467	17,924	25,543	25,436	50,979	49.9
Total, inorganic.....		280,043	33,017	227,026	198,365	425,391	46.6
Organic:							
Guano.....	6.0	1,278		1,278	346	1,624	21.3
Castor bean pomace.....	5.5	2,530		2,530	1,406	3,936	35.7
Fish scrap and meal.....	8.0	2,048	146	2,002	1,077	3,079	35.0
Tankage.....	7.5	16,896	1,375	16,521	1,020	17,541	5.8
All other.....		8,816		8,816	3,840	12,656	30.3
Total, organic.....		31,568	421	31,147	7,689	38,836	19.8
Grand total.....		291,611	33,438	258,173	206,054	464,227	44.4

¹ Estimated.

United States production of nitrogenous fertilizer materials is usually supplied partly by byproduct ammonium sulfate produced by the coke industry but mainly by various products derived from synthetic ammonia. This latter industry has developed since World War I but by 1935 was supplying 60 percent of United States production of chemical nitrogen. United States capacity for producing synthetic ammonia has increased very greatly during the war owing to the military uses of that product. This new capacity is largely Government-owned at present.

The total productive capacity, old and new, is roughly twice the estimated post-war consumption of nitrogen and it therefore seems likely that much of the Government-owned capacity will be converted to other uses or held in stand-by condition for an emergency rather than be operated either by the Government or by private industry to produce ammonia. However, it might be expected that some of the new capacity would be operated and that imports of nitrogen would be relatively less important after the war than in 1939.

According to a press release from the State Department (No. 293, April 3, 1945) an agreement has been reached with the Government of Chile that the United States Government does not intend to operate its synthetic nitrogen plants after the war and will consult with the Government of Chile as to their sale to private interests "for the purpose of reaching such accord with respect to those problems as would, while protecting the interests of the United States Government, give due consideration to the effects upon Chile, particularly from the point of view of the competitive situation created by the terms or conditions of the cession, sale, or lease of these plants." This agreement to "consult" with Chile does not invalidate the conclusion reached above that some of the new capacity is likely to be operated by private interests.

Imports of sodium nitrate have been chiefly the natural product from Chile. Calcium cyanamide has come chiefly from Canada. Ammonium sulfate and the other inorganic fertilizer materials have come from European countries, chiefly the Netherlands. Organic materials have come chiefly from Argentina and Japan. As the United States industry developed, the ratio of imports to consumption dropped.

The United States nitrogen industry was able to increase its share of the domestic market in the pre-war years even with imports of fertilizer nitrogen free of duty; therefore, it may be expected that, with new domestic capacity available after the war, the ratio of domestic production to consumption will increase still further. However, for certain fertilizer uses, natural sodium nitrate and calcium cyanamide are preferred, so it is probable that imports of these products will hold up better than those of nitrogenous fertilizers as a group.

Exports have been comparatively small in the past and are likely to increase only moderately.

POST-WAR SHORT TERM

The temporary shortage of chemical nitrogen fertilizers which developed during the war will be relieved when the war is over and anhydrous ammonia again becomes freely available for the production of fertilizers. It is probable that for a few years after the war both production and consumption of nitrogenous fertilizers will be considerably higher than in 1939. Imports will probably be somewhat lower than in 1939 because of the disorganization of European production.

POST-WAR LONG TERM

Consumption, Production, and Imports

Consumption of nitrogenous fertilizer materials will probably be larger in the post-war period than in 1939, even if the national income is at 1939 levels, largely because of the increase in population. On the other hand, it may be expected to be somewhat less than the estimated 620,000 short tons of fertilizer nitrogen consumed in 1943, even though the national income is 75 percent greater than in 1939, and though fertilizer nitrogen was in short supply in 1943. Consumption of fertilizer varies with farm income rather than with national income and farm income in 1943 was high relative to national income.

In the estimates below it is assumed that free entry of imports will continue and that a substantial portion of the new wartime capacity for the production of synthetic ammonia will continue to operate.

Per capita income at 1939 level.

Should consumption of nitrogenous fertilizer materials increase proportionately with population, consumption might be in the neighborhood of 512,000 short tons of nitrogen, of which 128,000 short tons, or 25 percent, might be imported. The foreign value of imports at 1939 prices of \$128 per ton of nitrogen might be about 16.4 million dollars. Production for the domestic market might approximate 384,000 short tons of nitrogen valued at 1939 prices of \$157 per ton, at about 60 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption might be about 30 percent greater than in 1939, or in the neighborhood of 600,000 short tons of nitrogen. Imports might amount to approximately 150,000 short tons of nitrogen (or about 25 percent of consumption) and, at \$147 per ton, have a foreign value of about 22 million dollars. Production for the domestic market might approximate 450,000 short tons of nitrogen and have a value, at \$180 per short ton of nitrogen, of about 81 million dollars.

Exports

Exports might range from 36,000 short tons of nitrogen at 1939 income levels valued, at 1939 prices, at about 6.4 million dollars, to about 41,000 short tons of nitrogen, at income levels 75 percent greater than those of 1939, valued, at prices 15 percent higher than in 1939, at approximately 8.4 million dollars.

Employment

It is estimated that approximately 6,000 persons were engaged in the production of nitrogenous fertilizers in 1939. With the increased production estimated for the post-war period, the number employed at the assumed higher level of income might amount to approximately 7,500 persons.

CRUDE BONES, OSSEIN, AND HIDE CUTTINGS

Tariff paragraph: 1627 and 1689.

Commodity: Crude bones, ossein, and hide cuttings.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total (est.)	For export	For domestic market			
Quantity (million pounds).....	576	0	576	105	681	Percent 15.4
Value (million dollars).....	17		17	12.4		
Unit value (per pound).....	\$0.03		\$0.03	\$0.023		
Persons employed (number).....	(?)					

¹ Foreign value.

² Crude bones and hide cuttings are waste products of the tanning and meat-packing industries; no data are available as to the number of persons engaged in handling them. Some ossein is produced from bone in the United States, and the number of persons engaged in this operation perhaps does not exceed 50.

Crude bones, ossein (made from bones by dissolving out the mineral salts with acid), and hide cuttings are raw materials for the manufacture of animal glues and gelatins. Crude bones are also used in

smaller amounts in the production of bone char, bonemeal, and knife handles, buttons, and similar articles.

Crude bones, principally from South America, account for about 75 percent of the total imports; ossein, almost exclusively from Belgium, accounts for about 10 percent; and hide cuttings, chiefly from the United Kingdom and Canada, for about 15 percent.

POST-WAR SHORT TERM

In the post-war short-term period consumption of these raw materials in the United States may be at a high level, compared to 1939, accompanied by increased production of their finished products in order to satisfy deferred consumer demand and to replenish depleted stocks. Imports and domestic production are both likely to be substantially larger than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Consumption of glue and gelatin raw materials in the United States will tend to increase with an increase in population and in per capita income, but not proportionally because of increased competition between hide glue and synthetic resin glues since 1937.

Per capita income at 1939 level.

Consumption of crude bones, ossein, and hide cuttings might be in the neighborhood of 715 million pounds, of which about 605 million might be produced domestically and 110 million, about 15 percent of consumption, might be imported. At 1939 prices, production might be valued at about 18.2 million dollars, and the foreign value of imports might approximate 2.5 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption might be in the neighborhood of 840 million pounds, of which about 710 million might be produced domestically and 130 million, about 15 percent of consumption, might be imported. Based on prices 15 percent above the 1939 level, production might be valued at about 24.5 million dollars, and the foreign value of imports might approximate 3.4 million dollars.

Exports

There have been no exports in the past and exports in the post-war period are likely to be negligible.

Employment

As pointed out before, crude bones and hide cuttings are waste products of other industries, and no employment data are available for these waste products. The number of persons engaged in the production of ossein might approximate 100 with the estimated increased production in the long-term post-war period.

PHOSPHATIC FERTILIZER MATERIALS

Tariff paragraph: 1627, 1685, 1740.

Commodity: Phosphatic fertilizer materials.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports ¹	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Gross weight (short tons).....	1 4, 113, 424	132, 047	3, 981, 377	66, 366	4, 047, 743	2
Value (\$1,000).....	1 50, 000	2, 133	47, 867	1 2, 123	49, 993	-----
Available phosphoric acid (P ₂ O ₅) (short tons) ²	1 737, 415	1 29, 356	708, 059	1 28, 613	734, 672	4
Value per ton of available phosphoric acid (P ₂ O ₅).....	\$68	\$73	-----	\$80	-----	-----
Persons employed (number).....	1 6, 000	-----	-----	-----	-----	-----

¹ Estimated.

² Foreign value.

* Includes commercially priced phosphoric acid in animal carbon and bone products.

The phosphatic fertilizer materials come from three principal sources—phosphate rock, basic slag, and bones. Of these, phosphate rock leads in importance, and supplies are available in practically unlimited quantities, with deposits scattered throughout the world. The United States is one of the world's largest producers of phosphate rock. Basic slag is a byproduct of the steel industry and is, therefore, limited in output. Although produced in large quantities in some European countries, United States production is very small, due to the low phosphorus content of its principal iron ores. Comparatively small quantities of bones are available for fertilizer use.

The phosphatic fertilizer materials include the superphosphates (normal, concentrated, and ammoniated), ammonium phosphates, basic slag, precipitated bone phosphate, animal carbon (bone black), bone ash, meal, and dust, and ground phosphate rock. Phosphatic fertilizers supply crops with phosphorus, which is one of the three fundamental plant foods. Not all the phosphorus contained in phosphatic fertilizers, however, is available as plant food; some is present in an insoluble form and has no commercial fertilizer value. The soluble or available portion is sold and referred to by the trade as available phosphoric acid (P₂O₅). In general, the phosphatic fertilizer materials are interchangeable, if allowance is made for their content of available phosphoric acid (P₂O₅).

Estimated United States production, imports, and consumption of the principal phosphatic fertilizer materials in 1939, in short tons of available phosphoric acid (P_2O_5), are shown below:

Item	Approximate available phosphoric acid (P_2O_5)	U. S. production ¹			Imports ¹	Apparent consumption ¹	Ratio of imports to consumption
		Total	For export	For domestic market			
	Percent						Percent
Superphosphate, normal.....	16-18	564, 127	16, 000	548, 130	2, 449	550, 579	(²)
Superphosphate, concentrated.....	40-45	122, 738	3, 200	119, 538	2, 215	121, 753	2
Superphosphate, ammoniated.....	16	5, 260	(³)	5, 260	26	5, 286	(³)
Ammonium phosphates.....	40-50	24, 000	10, 159	13, 841	19, 598	33, 439	58
Basic slag.....	8-16	3, 200	(³)	3, 200	63	3, 268	2
Precipitated bone phosphate.....	40	6, 000	(³)	6, 000	1, 037	7, 037	15
Animal carbon.....	30	3, 000	(³)	3, 000	93	3, 093	3
Bone ash, meal, and dust.....	25	6, 250	(³)	6, 250	1, 127	7, 377	15
Other phosphatic fertilizer materials.....	(⁴)	2, 840	(³)	2, 840	(³)	2, 840	-----
Total or average.....		737, 415	29, 356	708, 059	26, 613	734, 672	4

¹ Estimated; includes commercially priced phosphoric acid in animal carbon and bone products.

² Less than 0.5 percent.

³ Small, if any.

⁴ Various.

⁵ Ground phosphate rock used as fertilizer.

Farm income is the basic factor determining the amount of fertilizer used by American farmers. Changes in the farm income are reflected in the consumption of fertilizers, and in some areas the tonnage consumed follows almost the same trend as farm income. In addition, consumption of phosphatic fertilizers also shows a long-term tendency toward increase, owing to the depletion of the soil's phosphorus with continued cultivation.

The United States apparent consumption of phosphatic fertilizer materials in the period 1935-39 ranged between a low of 577,000 short tons of available phosphoric acid (P_2O_5) in 1935 and a high of 806,000 tons in 1937, and averaged about 700,000 tons. There appears to have been a steady upward trend in the consumption during this period, except for the abnormally large consumption in 1937. The consumption of 735,000 short tons in 1939, therefore, may be considered about normal. The apparent consumption in 1943 was about 1,300,000 tons in terms of available phosphoric acid (P_2O_5), or about 75 percent above the 1939 level.

In the 5 pre-war years 1935-39, total United States production increased from 581,000 short tons of available phosphoric acid (P_2O_5) to 737,000 tons, with an exceptionally high amount of 800,000 tons in 1937. About 93.5 percent of the output in this period was supplied by the superphosphates, 3.5 percent by ammonium phosphate, and the remaining 3 percent by basic slag, precipitated bone phosphate, animal carbon, bone meal, and ground phosphate rock. The manufacture of superphosphate is based on domestic phosphate rock, and the plants are economically located in the principal fertilizer-consuming areas, particularly along the East coast, and in the Southern cotton states.

United States imports for consumption in the period 1935-39 fluctuated between a low of about 13,000 short tons of available phosphoric acid (P_2O_5) in 1935 and a high of 30,000 tons in 1937, and averaged about 22,000 tons, or less than the 27,000 tons imported in 1939. Imports constituted only about 2 percent of United States consumption in 1935 and 1936 and only about 4 percent in the period 1937-39. About 60 percent of the total imports consisted of ammonium phosphate, which came principally from Canada. Imports of superphosphate averaged about 28 percent of the total and came from Canada, Belgium, the Netherlands, and Germany. Of the remaining phosphatic fertilizers, amounting to about 12 percent of the total, imports of precipitated bone phosphate came principally from Belgium; bone ash, meal, and dust came variously from Argentina, Germany, Belgium, China, and British India; and small amounts of basic slag were imported from Belgium.

POST-WAR SHORT TERM

In the first few years after the war, United States consumption of phosphatic fertilizer materials is likely to be maintained or slightly increased over the wartime level. United States production during this period may increase in order to supply the requirements for the rehabilitation of the liberated European countries and the Far East. Imports, however, are likely to be small, consisting principally of Canadian superphosphate and ammonium phosphate.

POST-WAR LONG TERM

Per capita income at 1939 level.

Consumption of phosphatic fertilizer materials is likely to be about 775,000 short tons of available phosphoric acid (P_2O_5), or 5 percent above the 1939 level and 11 percent above the 5-year pre-war average. Imports may total about 4 percent of the apparent consumption, or about 31,000 tons. (This quantity is about 15 percent higher than imports in 1939 and 40 percent higher than the pre-war average.) Assuming prices as in 1939, imports would have a foreign value of about 2.5 million dollars. With imports at this level and consumption as indicated, United States production for the domestic market would total about 745,000 short tons of available phosphoric acid (P_2O_5), (about 5 percent above 1939 and 10 percent above the 5-year pre-war average). At 1939 prices, this production would have a value of about 51 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of phosphatic fertilizer materials might remain at about the wartime level and amount to about 1,300,000 short tons of available phosphoric acid (P_2O_5), about 75 percent above 1939 consumption and 85 percent above the 5-year pre-war average. Imports may be about 4 percent of the apparent consumption, or about 52,000 tons (about 90 percent higher than 1939 imports and 135 percent higher than the pre-war average). Assuming a 10-percent increase in foreign prices over 1939, the foreign value of imports may amount to about 4.6 million dollars. With these levels of consumption and imports, production for the domestic market would be about 1,250,000 short tons of available phosphoric acid (P_2O_5). Assuming a 10-percent

increase in prices over 1939, the value of domestic production would amount to about 94 million dollars.

Exports

In the 5 years 1935-39, United States exports increased steadily from 17,000 short tons of available phosphoric acid (P₂O₅) to 29,000 tons, and averaged about 23,000 tons. Exports consisted principally of superphosphates and ammonium phosphate. In terms of the available phosphoric acid (P₂O₅), about two-thirds of United States exports went to Canada and Cuba as superphosphates, and the remainder was ammonium phosphate destined principally for the Philippines, the Netherlands Indies, and Japan. In 1944, the greater part of the United States production of concentrated superphosphate was allocated for export to the United Kingdom.

During the transitional years after the war United States exports of phosphatic fertilizer materials are likely to be much higher than the pre-war level. In the long-term post-war period, United States exports may be expected to amount to about the same proportion as 1939, that is, about 4 percent of the total United States production of available phosphoric acid (P₂O₅). Thus exports would be about 32,000 short tons of available phosphoric acid under the lower assumed income and about 54,000 tons under the higher assumed level.

Employment

The number of wage earners employed in the manufacture of phosphatic fertilizer materials was about 6,000 in 1939, and increased to from 7,000 to 7,500 in 1943. Since the United States post-war production of phosphatic fertilizers is likely to be between the 1939 and the 1943 levels, the number of wage earners may also be expected to vary in proportion and amount to from 6,000 to 7,500 in the post-war period.

COAL TAR AND COAL-TAR CRUDES

Tariff paragraph: 1651.

Commodity: Coal tar, its crude derivatives, and crude light-oil derivatives.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Imports	Production			Imports	Appar-ent con-sumption	Ratio of imports to con-sumption
	Total ¹	For ex-port	For do-mestic market ¹			
Quantity (1,000 pounds).....	7,857,419	226,306	7,731,113	595,243	8,326,356	Percent 7.1
Value (\$1,000).....	\$ 67,817	4,576	\$ 63,041	\$ 7,212		
Unit value (per pound).....	\$0.0085	\$0.020	\$0.0082	\$0.012		
Persons employed (number).....	7,500					

¹ An effort has been made to avoid, as far as possible, duplication in the statistics of production by including all of the ultimate products of distillation, but only that part of the tar which is not distilled.

² Estimated.

³ Foreign value.

Products included in this report are those derived principally from coal in the process of converting coal to coke, usually in byproduct coke ovens, and to a lesser extent from coal or oil in the process of manufacturing industrial and illuminating gases. These products consist of light-oil distillates (such as benzene, toluene, and the xylenes), the crude tar and distillates (such as dead or creosote oil, the tar acids, and naphthalene), and road tars and pitch.

The United States is one of the world's largest producers of coal-tar and light-oil derivatives. The quantity produced is largely dependent upon the quantity of coke required by the steel industry. The coal tar produced may be completely distilled, "topped" (i. e., partially distilled to remove the components most in demand), or burned as fuel. If coal tar is produced on too small a scale to warrant distillation on the spot, it will not ordinarily be distilled as it does not pay to transport it any distance. Thus the disposition made of the coal tar depends on the conditions under which it is produced, on the demand for and the prices of the products of distillation (such as naphthalene, tar acids, and creosote oil), and on the price of fuel oils. This situation explains why the United States has, in the past, burned large quantities of tar as fuel while at the same time it imported coal-tar distillates. In 1939, about 30 percent of all tar produced in the United States was burned for fuel but the proportion thus consumed during the war was substantially lower, owing to restrictions placed on the use of tar for this purpose.

Large demand during the war for the coal-tar and light-oil products used in making explosives, aviation fuels, plastics, dyes, medicinals, wood preservatives, synthetic rubbers, and other products has resulted in a maximum production of crudes and the expansion of production and processing facilities wherever possible. In 1939, United States production of coal tar, all crude derivatives of coal tar, and crude derivatives of light oil was about 8.0 billion pounds, valued at approximately 67.6 million dollars, with an average unit value of 0.85 cents per pound. In 1943 the production of the same products was about 11.6 billion pounds, valued at approximately 143.3 million dollars, with a unit value of 1.2 cents per pound, an increase of 45 percent in the quantity and 112 percent in value over the corresponding production in 1939.

Consumption of naphthalene has increased because it is a raw material widely used in the manufacture of resins, phthalate plasticizers, insect repellents, and the anthraquinone vat dyes. Demand for these products will probably continue to be fairly heavy after the war. The trend of United States production of naphthalene has been upward since 1933; production increased sharply from 104 million pounds in 1939 to 305 million in 1943. The trend in the production of creosote oil, used chiefly as a wood preservative, was likewise upward before the war; production increased from 992 million pounds in 1939 to 1,576 million in 1943.

United States production of crudes from coal tar, in the post-war short- or long-term period, is not likely to exceed the peak wartime volume, and an unusually high demand for individual products is likely to be met by imports or, to some extent, by domestic products obtained, by synthesis, from petroleum.

Imports in 1939, a normal pre-war year for imports of this group, amounted to 7.1 percent of the total quantity of all these products

consumed in the United States in that year. These came principally from the United Kingdom, Germany, and Belgium. The products imported in the most significant quantities were creosote oil and crude naphthalene, which together accounted for over 85 percent of all of the group under consideration. Statistics for these two items are shown below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 lb.):						<i>Percent</i>
Creosote oil.....	992, 178	21, 580	970, 598	466, 889	1, 437, 487	32
Naphthalene.....	104, 086		104, 086	41, 104	145, 190	28
Total.....	1, 096, 264	21, 580	1, 074, 684	507, 993	1, 582, 677	32
Value (\$1,000):						
Creosote oil.....	¹ 13, 450	337	13, 113	² 5, 769		
Naphthalene.....	¹ 1, 769		1, 769	² 459		
Total.....	15, 219	337	14, 882	² 6, 228		
Unit value (cents per lb.):						
Creosote oil.....	1.4	1.6	1.4	1.2		
Naphthalene.....	1.7		1.7	1.1		
Average.....	1.4	1.6	1.4	1.2		

¹ Estimated.
² Foreign value.

Cost of transportation may sometimes favor importation of the coal-tar crudes for consumption in the Atlantic or Pacific coast regions of the United States, since the rates on transocean shipments of foreign crudes to these regions is sometimes less than the rail rates from inland points in the United States.

POST-WAR SHORT TERM

In view of the marked upward trend in the domestic consumption of coal-tar derivatives before the war, consumption will probably be considerably larger than in 1939. Byproduct coke ovens will probably be more active than in 1939, and this activity will make adequate quantities of domestic coal-tar and crude distillates available for refining.

Imports will probably be substantially lower than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

In view of the increased production of synthetic organic chemicals which will probably follow a demand for larger quantities of coal-tar crudes and crude distillates, it will presumably be profitable to recover and refine a larger part of the products of the byproduct coke-oven industry than in 1939. Thus increased demand will be met largely by increased domestic production. However, imports of crude naphthalene, the tar acids, and creosote oil will probably be necessary in considerable quantities, as in the past.

Per capita income at 1939 level.

United States consumption of coal tar, coal-tar crudes, and the crude light oils will probably be in the neighborhood of 9.6 billion pounds, or about 115 percent of consumption in 1939. About 95 percent of consumption will probably be supplied by domestic producers, in which case production for the domestic market might be about 9.1 billion pounds, valued at about 77 million dollars, at 1939 prices. Imports might account for about 5 percent of domestic consumption and might total about 500 million pounds. At 1939 prices the foreign value of these imports would be about 6 million dollars.

Per capita income 75 percent higher than in 1939.

United States consumption of the coal-tar items included will probably be in the neighborhood of 11.6 billion pounds, or about 140 percent of consumption in 1939. About 95 percent of consumption requirements are likely to be supplied by domestic producers; thus production for the domestic market might be about 11 billion pounds valued at about 110 million dollars, at 1 cent per pound. Imports might account for about 5 percent of domestic consumption, and might total about 600 million pounds. At 1.5 cents per pound, the foreign value of these imports would be 9 million dollars.

Exports

Before the war United States exports of crude coal-tar derivatives (consisting chiefly of dead or creosote oil) went principally to Canada and the Latin-American countries. Demand for these products will probably expand owing to greater industrial activity in these countries. With an increase in world income level, exports might reach 500 million pounds, with a value of about 10 million dollars, at a unit value of 2 cents per pound.

Employment

The number of factory workers engaged in the manufacture of this group of products is estimated to have been about 5,000 in 1939. The number of factory workers currently engaged in this industry is estimated to be in the neighborhood of 6,000; at least that number of employees would be required to produce the quantities estimated under a post-war income 75 percent higher than in 1939.

SODIUM CYANIDE

Tariff paragraph: 1667.
Commodity: Sodium cyanide.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production (refined)	Exports (refined)	Production for domestic market (refined)	Imports (chiefly crude)	Apparent consumption
Quantity (1,000 pounds).....	16,000	2,339	13,661	2,278	(²)
Value (\$1,000).....	2,240	295	1,945	2,737	
Unit value (per pound).....	\$0.14	\$0.13	\$0.14	\$0.07	
Persons employed (number).....	60-60				

¹ Does not include reexports (chiefly crude) of 3,406,000 pounds, valued at \$386,000.

² Gross imports, less reexports (see footnote 1).

³ No consumption figure available as imports are of a different grade from production and exports; and a part of the domestic production is by refining the imported crude grade.

⁴ Foreign value.

Sodium cyanide is a white, water-soluble, poisonous compound used principally in the extraction of gold and silver ores, in the fumigation of citrus trees, in the destruction of rats and vermin, and in the production of synthetic resins and special-purpose synthetic rubber. It is also employed for electroplating, case hardening, and as a flotation agent in mineral separations. The principal source of imports has been Canada, from which is obtained chiefly the crude grade, averaging about 50 percent sodium cyanide. This crude grade is used directly by the mining industry. On the other hand, United States production and imports from other sources than Canada consist of the refined grade, containing 96 to 98 percent sodium cyanide, which is used in fumigation and for most other uses, except in the extraction of gold and silver and synthetic rubber production. The United States production of refined sodium cyanide is manufactured from domestic materials (sodium metal, ammonia, and charcoal) and the imported Canadian crude grade.

During the war years consumption of crude and refined sodium cyanide combined has more than doubled owing principally to increased requirements for case hardening, metal plating, special-purpose synthetic rubber, and other uses. Production has increased approximately three times that in 1939, and imports have risen to about 70 million pounds per year. Exports have also increased during the war. The production, imports, and exports of sodium cyanide during 1939 were fairly normal for pre-war years.

POST-WAR SHORT TERM

The consumption of sodium cyanide in the United States during the immediate post-war period may increase substantially above that during 1939, as it seems probable that it will be used to a greater extent for fumigation, production of synthetic rubber, and treatment of metal, and that there will be a slight increase in the extraction of gold and silver. It seems likely that production will increase with the increased consumption of the refined grade and with a temporary increase in exports. It also seems likely that imports will increase in order to supply the needs for gold and silver extraction, for synthetic rubber, and for domestic production of refined sodium cyanide.

POST-WAR LONG TERM

Consumption, Production, and Imports

Consumption of the refined grade of sodium cyanide in fumigation is likely to increase in the post-war period as the saving and advantages resulting from fumigation is realized by more and more users and as per capita income rises. An increase in domestic production of refined cyanide will be reflected to some extent in increased imports of the crude grade. Imports of crude are likely also to be increased by an expansion of gold and silver mining which declined during the war and for the production of synthetic rubber.

Per capita income at 1939 level.

At this low level of national income the consumption of both refined and crude cyanide is likely to be less in the post-war long term than in the post-war short term, although possibly higher than in 1939. Consumption of crude will depend to some extent, however, on the monetary value of gold in the United States and in other countries, on whether or not the United States Government continues its silver-purchase policy of the 1930's, or similar policies, and on the domestic production of synthetic rubber.

Net imports may be in the neighborhood of about 60 million pounds, the foreign value of which, at 5 cents per pound, would be about 3 million dollars. As the foreign value per pound of the Canadian material has dropped since 1939 from 7 cents to about 4 cents per pound, owing to increased production at lower costs, the average foreign value of imports in the post-war period will probably be only slightly higher than in 1939. Production for the domestic market will probably be 15-20 million pounds, with a value of about 2.1-2.8 million dollars at 14 cents per pound.

Per capita income 75 percent higher than in 1939.

At this level of national income, consumption of refined sodium cyanide would probably be much greater, possibly by as much as 50 percent, than in 1939. It is much more difficult to predict the course of consumption of the crude, although it would probably be considerably higher than in 1939. Probably the most important factors will be the monetary value of gold, the silver policy of the United States Government, and the production of special-purpose synthetic rubber.

Production for the domestic market will probably be from 20 to 25 million pounds, valued at 2.8-3.5 million dollars, at 14 cents per pound, and imports (less reexports), about 70 million pounds, with a foreign value of roughly 3.5 million dollars, at 5 cents per pound.

Exports

Exports of sodium cyanide will probably be about the same during the post-war long-term period as they were during 1939. The principal markets for United States sodium cyanide have been Canada, Mexico, certain South American countries, and the Philippine Islands, and there is no reason to expect a considerable increase in their consumption or a change in our export markets.

Employment

The number of persons required for the domestic production of sodium cyanide will probably be somewhat greater than the number employed in this industry during 1939 if production is increased to 25 million pounds but will probably not exceed 75 factory employees.

ANIMAL GLANDS FOR PHARMACEUTICAL USE

Tariff paragraph: 1669.

Commodity: Pituitary, thyroid, and other glands, crude.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 5, 000	(3)	1 5, 000	648	5, 648	<i>Percent</i> 11. 5
Value (\$1,000).....	1 1, 000	(3)	1 1, 000	1 134		
Unit value (per pound).....	\$0. 20			\$0. 21		
Persons employed (number).....	1 60					

- 1 Estimated.
- 2 Negligible.
- 3 Foreign value.

This section covers the pancreas, pituitary, thyroid, and other glands and glandular organs, except the liver, which are obtained as byproducts by the packing-house industry. They are the raw materials from which insulin and other glandular medicinals are manufactured. These medicinal preparations are prescribed chiefly for human diseases caused by abnormalities or deficiencies in the glands of the patient.

Imports are chiefly from Canada, Argentina, and Brazil. Exports have been negligible in the past and will probably continue to be.

POST-WAR SHORT TERM

United States consumption of crude glands in the short-term period will probably increase because of increased demand for glandular medicinals at home and for export to Europe and Latin America. Imports will probably be larger than those during 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Imports will probably furnish a larger proportion of consumption than in 1939 because it appears unlikely that United States production will be expanded to meet the increased demand.

Per capita income at 1939 level.

Consumption in the United States of these crude glands might total about 9 million pounds. Imports might be about 15 percent of consumption or about 1.35 million pounds, with a foreign value of about 270,000 dollars, at 1939 prices. United States production might be about 7.65 million pounds, with a value of about 1,530,000 dollars at 1939 prices.

Per capita income 75 percent higher than in 1939.

United States consumption of crude glands for conversion into medicinal preparations might reach about 12 million pounds. Imports might be about 25 percent of consumption, or about 3 million pounds, with a foreign value of \$720,000, at 24 cents per pound. United States production might amount to about 9 million pounds, having a value of about \$2,160,000, at 24 cents a pound.

Employment

There are no official statistics on the number of wage earners. It is estimated that there were about 50 wage earners in 1939. With the amount of production predicated at the higher level of income, post-war employment in this segment of the meat-packing industry might reach 125.

PSYLLIUM SEED

Tariff paragraph: 1669.
Commodity: Psyllium seed.
Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds)-----	2, 184
Value (\$1,000)-----	1 200
Unit value (per pound)-----	\$0. 092

¹ Foreign value.

Psyllium seed is the dried ripe seed of several species of *Plantago* plants. It is used as a mild laxative. The two commercially important species are black psyllium of France, and blonde psyllium of British India. Black psyllium is preferred slightly to the blonde, but the latter has captured the bulk of the domestic market because of its lower price. Part of this product is sold as such by the retail drug trade and part is compounded with other drugs in proprietary medicinals.

Before the war there was no domestic production of psyllium seed. During the last 3 years a small amount of black psyllium seed, estimated at 20,000-30,000 pounds annually, has been produced in southern Arizona. This small domestic output is likely to be discontinued at the end of the war because of the lower price of the imported product.

Imports of psyllium seed averaged about 3 million pounds annually before the war, but the trend has been slightly downward. Since 1940, owing partly to shortage of transportation facilities, the average imports have been slightly less than 2 million pounds yearly. During 1939, imports of psyllium seed from British India were roughly double those from France.

POST-WAR SHORT TERM

Imports of psyllium seed will probably increase substantially during the first few years after the war in order to build up depleted stocks in this country. Shipments from British India have been restricted for several years, and practically none have been received from France during the war years.

POST-WAR LONG TERM

Consumption in the post-war long term, practically all of which will be supplied by imports, is likely to be substantially higher than before the war because psyllium seed is likely to assume a more important position among laxatives than before, owing largely to extensive advertising.

Per capita income at 1939 level.

Imports of psyllium seed will probably be about 15 percent above those in 1939, or about 2½ million pounds, with a foreign value of about \$230,000 at 1939 prices.

Per capita income 75 percent higher than in 1939.

Psyllium seed imports will probably be 50 percent above 1939, or about 3¼ million pounds, with a foreign value of about \$325,000, allowing for a moderate increase in prices.

PAWPAW JUICE OR CRUDE PAPAIN

Tariff paragraph: 1669.
Commodity: Pawpaw juice or crude papain.
Rate of duty: Free.

GENERAL

Data on United States imports for 1939 are given below:

Quantity (1,000 pounds)-----	273
Value (\$1,000)-----	1 336
Unit value (per pound)-----	\$1. 23

† Foreign value.

Pawpaw juice or crude papain is the dried juice derived from the unripe fruit of the papaya tree. It is obtained by scarifying the surface of the papaya melon and collecting and drying the exuding latex. Pawpaw juice or papain produced in this manner contains a digestive enzyme somewhat similar to pepsin. Crude papain is used chiefly in the manufacture of preparations for tenderizing meats.

There is no domestic production or export of crude papain. Imports have been principally from Ceylon and British East Africa. The United States consumes the major portion of the exports of these producing countries.

‡ The trend of imports in pre-war years had been definitely upward, the quantity of crude papain imported in 1939 being about 35 percent above that in 1936. During the war years (1942-44) imports have been between 255,000 and 265,000 pounds annually.

POST-WAR SHORT TERM

Imports of pawpaw juice or crude papain will probably increase considerably in the immediate post-war years.

POST-WAR LONG TERM

United States consumption of crude papain has increased as national income increased in pre-war years. However, this product, fairly new on the domestic market, has not been widely advertised, and its consumption might increase more rapidly than national income as its use for tenderizing meats becomes more widely recognized.

Per capita income at 1939 level.

Imports of pawpaw juice or crude papain might amount to approximately 400,000 pounds (a 45-percent increase over 1939), with a foreign value, at 1939 prices, of about \$500,000.

Per capita income 75 percent higher than in 1939.

Imports of crude papain will probably be about 50 percent above those at the lower level of income (120 percent increase over 1939) or around 600,000 pounds, with a foreign value, at \$1.40 a pound, of \$840,000.

FLORAL ESSENCES AND CONCRETES

Tariff paragraph: 1673.

Commodity: Floral essences and concretes, nonalcoholic.

Rate of duty: Free.

GENERAL

Data on United States imports for 1939 are given below:

Quantity (1,000 pounds)-----	7.2
Value (\$1,000)-----	¹ 862
Unit value (per pound)-----	\$119.08

¹ Foreign value.

Floral essences and concretes are natural flower products used in the manufacture of perfumery. Floral concretes are separated from flowers by extraction with an organic solvent which is subsequently evaporated. Floral essences or absolutes are made from floral concretes by separating the floral waxes.

France has been by far the most important source of floral essences and concretes. None of these products is produced to any appreciable extent in the United States. Before the war, the quantity of imports of floral essences and concretes was decreasing in relation to national income, although the total value of these imports was increasing.

Jasmin essences and concretes are the most important of these products, accounting for about 90 percent of imports by value in 1939. Since the war, imports have been replaced to some extent by low-priced synthetic-jasmin oils. When the natural product is again available, it will probably be used in high-priced perfumes either alone or blended with the synthetic material. Synthetic jasmin will probably continue to be used chiefly in popular priced perfumes and toilet preparations. A large increase in demand for floral essences and concretes would probably be met by the use of synthetic products as extenders. Other floral essences and concretes include rose, orange flower, tuberose, and violet.

POST-WAR SHORT TERM

In the first few years after the war, production of floral essences and concretes will probably be resumed in France, but it is doubtful whether the quantity of these products available for import into the United States will be as great as in 1939. The unit value of these imports, however, might be considerably greater.

POST-WAR LONG TERM

Consumption and Imports

Per capita income at 1939 level.

With income the same as in 1939, consumption of floral essences and concretes might be equal to or slightly less than in 1939, or about 6,500 pounds. Imports would have a foreign value of about \$780,000 at 1939 values.

Per capita income 75 percent higher than in 1939.

An increase in national income would bring about an increase in the consumption of quality perfumes, and an increased demand for natural jasmin and other flower oils. Consumption (and imports) of floral essences and concretes might increase to 120 percent of the 1939 level, or to about 8,600 pounds. At \$132 per pound (a 10-percent increase over the unit value in 1939), the foreign value of imports would be about \$1,135,000.

Exports

Exports of floral essences and concretes are negligible.

COMPOUNDED AND MIXED FERTILIZERS

Tariff paragraph: 1685.

Commodity: Compounded or chemically combined fertilizers, and prepared fertilizer mixtures.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 short tons).....	5,329	7	5,322	40	5,362	Percent 7
Value (\$1,000).....	122,630	238	122,392	11,531		
Unit value (per short ton).....	\$23.01	\$34.23	\$23.00	\$37.64		
Persons employed (number).....	10,000					

¹ Foreign value.

² Estimated.

This section covers all fertilizer mixtures or compounds which supply two or all three of the primary plant foods—nitrogen, phosphorus, and potassium. Most of these fertilizers are simply mechanical mixtures of a nitrogenous, a potassic, and a phosphatic fertilizer, but some of them involve chemical compounds of these elements.

Approximately two-thirds of United States consumption of fertilizer is in the form of mixed fertilizers. Domestic production supplies almost all the mixed fertilizers consumed (99 percent in 1939). Imports of mixtures are small, though several times greater than exports. In 1939, they came principally (92 percent by quantity) from Canada. Mixed fertilizers in international trade tend to be specialties which command relatively high unit prices. In 1939, imports accounted for only three-fourths of 1 percent of consumption.

POST-WAR SHORT TERM

The shortage of chemical nitrogenous fertilizers during the past few years indicates that both consumption and production of compounded fertilizers and fertilizer mixtures may be considerably greater for a few years after the war than in 1939.

POST-WAR LONG TERM**Consumption, Production, and Imports**

The apparent consumption of mixed fertilizers was about 5.4 million short tons in 1939. Owing to increased population, it may be somewhat greater than this amount in the post-war long-term period if the national income is at the 1939 level. On the other hand, even if the per capita national income is 75 percent higher than in 1939, consumption is likely to fall somewhat short of the estimated consumption of 7.1 million short tons in 1943, which was achieved under the stimulus of an exceptional wartime demand for farm products at good prices.

Per capita income at 1939 level.

Assuming that consumption of compounded fertilizers and prepared fertilizer mixtures would increase in proportion to the increase in population, consumption might be in the neighborhood of 5.9 million short tons, of which about 45,000 short tons, or about three-fourths of 1 percent, might be imported. The foreign value of imports, at 1939 prices of about \$37.50 per ton, might approximate 1.7 million dollars. Production for the domestic market might be about 5.9 million short tons, with a value, at 1939 prices, of \$23.00 per ton, of about 135.7 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption might be about 25 percent greater than that of 1939, or approximately 6.7 million short tons. Imports might be about three-fourths of 1 percent of consumption, or about 50,000 short tons, with a foreign value, at \$43.00 per ton, of about 2.1 million dollars. Production for the domestic market might be about 6.7 million short tons with a value, at \$26.50 per ton, of about 177.6 million dollars.

Employment

Approximately 10,000 persons were employed in the production of these fertilizer materials in 1939. Increased post-war production for the domestic market and for export might result in employment increasing to about 10,500 persons if the per capita income were at the 1939 level, and to about 11,600 persons if the per capita income were 75 percent higher than in 1939.

Exports

Exports have been extremely small, amounting in 1939 to about one-tenth of 1 percent of United States production. It is probable

they may not exceed that proportion in the long-term post-war period. Exports may range from about 7,600 short tons, valued at about \$260,000 at the 1939 income level, to about 9,200 short tons valued at about \$363,000 if income is 75 percent higher and prices are substantially higher than in 1939.

POTASSIC FERTILIZER MATERIALS

Tariff paragraph: 1685, 1745, and 1746.
Commodity: Potassic fertilizer materials.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production				Imports	Appar-ent con-sump-tion	Ratio of imports to con-sump-tion
	Total ¹	Sales ²	For ex-port	For do-mestic market			
Gross weight (short tons).....	546, 757	589, 633	136, 750	452, 883	237, 236	690, 119	<i>Percent</i> 34
Value (\$1,000).....	\$ 10, 303	\$ 11, 187	4, 447	6, 740	\$ 5, 752		
Potash (K ₂ O) content (short tons).....	312, 201	340, 647	\$ 82, 050	258, 597	94, 297	352, 594	27
Value per ton of potash (K ₂ O).....	\$33	\$33	\$54		\$61		
Persons employed (number).....	1, 516						

¹ Includes both fertilizer and chemical potash.

² Does not include 7 percent of domestic production sold as chemical potash.

³ Estimated.

⁴ Value at plant.

⁵ Foreign value.

⁶ Calculated on a basis of 60 percent potash.

The potassic fertilizer materials are obtained principally from potassium-bearing minerals and natural brines. Minor amounts are also obtained from the Chilean nitrate industry, seaweeds, cement-kiln flue dust, distillery and sugar-beet waste, cottonseed-hull ashes, and wood ashes.

Potassic fertilizer materials are sold on the basis of their potash (K₂O) content and are usually called potash by the trade. Before the war, about 93 percent of the potash produced in the United States was consumed as an ingredient of fertilizers, the rest being used by the chemical industry in the manufacture of chemicals, soap, glass, and explosives. Usefulness of these fertilizer materials depends on their ability to supply potassium in a form immediately available to crops for the processes of growth. Although there are important exceptions, potassic fertilizer salts are interchangeable, if allowances are made for potash content. Potassium chloride, which includes muriate of potash, manure salts, and kainite, is the most important of these materials.

The estimated United States production, imports, and variations in consumption of the principal potassic fertilizer materials, in short

tons of potash (K_2O), for 1939, with the approximate percentage of potash (K_2O) contained in each material, are shown below:

Potassic fertilizer material	Approximate K_2O content	Production			Imports ¹	Apparent consumption	Ratio of imports to consumption
		Sales ¹	For export ¹	For domestic markets ¹			
	<i>Percent</i>						<i>Percent</i>
Muriate of potash.....	60	285,000	62,000	223,000	53,251	276,251	19
Manure salts.....	30	50,000	20,000	30,000	652	30,652	2
Kainite.....	14-20	1,000	0	1,000	4,160	5,160	81
Sulfate of potash.....	45	5,000	0	5,000	21,232	26,232	81
Sulfate of potash-magnesia.....	22	0	0	0	3,405	3,405	100
Potassium nitrate, crude.....	44	0	0	0	3,785	3,785	100
Potassium-sodium nitrate mixtures, crude.....	14	0	0	0	7,723	7,723	100
Other ²		(³)	(³)	(³)	89		
Total (actual K_2O content).....		340,047	82,050	258,597	94,297	352,894	27

¹ Estimated.

² Includes small amounts of wood and cotton-hull ashes and beet-root ashes.

³ Not available; believed to be small, if any.

⁴ Does not include 7 percent of domestic production sold as chemical potash.

⁵ Calculated on a basis of 60 percent K_2O .

During 1933-41 the United States apparent consumption of fertilizer potash, in terms of contained potash (K_2O), ranged between a low of 249,000 short tons (1934) and a high of 530,000 tons (1937) and averaged 380,000 tons. Therefore, the consumption of 353,000 tons in 1939 was 7 percent below the pre-war 9-year average. The apparent consumption in 1943 was about 580,000 short tons, or about 65 percent above the 1939 level.

The two principal potash-producing areas in the United States are the ore beds in New Mexico, and the natural brines of California. Small amounts of potash are derived from brine in Utah and as a byproduct from cement dust and molasses in Maryland. In terms of potash content, total United States production of potash, including both fertilizer and chemical grades, exceeded 100,000 short tons for the first time in 1933. It reached 317,000 tons in 1938 and amounted to 312,000 tons in 1939. Since 1939 it has more than doubled. Similarly United States production of fertilizer potash for the domestic market has shown a definite trend upward from about 91,000 short tons, in terms of contained potash (K_2O), in 1934 to 219,000 tons in 1938, 259,000 tons in 1939, and 423,000 tons in 1941. With imports of potassic fertilizer materials shut off from Germany and France, domestic production has been expanded to supply all the domestic requirements as well as exports.

Germany and France were the principal pre-war suppliers of potassic fertilizer materials. These two countries, along with Spain and Poland, were members of the International Potash Cartel, which controlled about 80 percent of the world's pre-war production of potash. In the period 1933-41 imports of potassic fertilizer materials in terms of contained potash K_2O fluctuated between a low of 158,000 short tons (1934) and a high of 336,000 tons (1937) and averaged about 180,000 tons. Imports of 94,000 short tons in 1939 therefore were abnormally low, and the much lower imports of 1941 and subsequent years reflect wartime conditions. From 1933 to 1939, imports ranged from 27 percent of the consumption (1939) to 63 percent (1934 and 1937), with an average of about 53 percent for the period.

POST-WAR SHORT TERM

The wartime level of consumption of potassic fertilizer materials will probably be maintained in the first few years after the war. During this period production for domestic consumption may decline 5 or 10 percent from the wartime level as a result of small imports from Spain, France, and possibly Palestine. The disrupted German and Polish potash industries are not likely to furnish any supplies to the United States during the first years after the war.—

POST-WAR LONG TERM**Consumption, Production, and Imports**

Consumption of potassic fertilizer materials shows a long-term trend toward increase as the potassium in the soil of agricultural land is depleted in crop production. Much more important, however, in year-to-year fluctuations are the changes in farm income, since purchases of fertilizers by farmers vary in proportion to farm income. In wartime, however, farm income has expanded more rapidly than national income as a whole and may drop somewhat even if national income is maintained at wartime levels.

In the years immediately preceding the war, imports, largely controlled by the Potash Cartel, supplied the bulk of the consumption along the eastern seaboard and domestic production, the remainder. Inasmuch as before the war a large part of the pre-war advantage of European potash in that area consisted of lower cost of transportation and inasmuch as this advantage is likely to prevail in the post-war long term, European producers may again be expected to supply eastern-seaboard demand. If so, United States production and imports may supply about the same proportions of total United States consumption of potassic fertilizer materials as they did before the war.

Per capita income at 1939 level.

Consumption of potassic fertilizer materials may be somewhere between the 1939 figure of about 350,000 short tons, in terms of contained potash (K_2O), and 400,000 tons, which is about 15 percent higher. Imports into the important eastern consuming area may supply about 45 to 60 percent of consumption, or about 155,000 to 240,000 short tons. This quantity is from 60 to 155 percent higher than the 1939 imports and from 20 percent below to 30 percent higher than the more normal 1938 imports. Assuming foreign prices as in 1939, imports, in this quantity, would have a foreign value of about 9–15 million dollars. With imports at this level and consumption as indicated, United States production for the domestic market would amount to about 110,000–245,000 short tons of contained potash (K_2O) with a value of 3.3–8.1 million dollars, at 1939 prices.

Per capita income 75 percent higher than in 1939.

Consumption of potassic fertilizer materials might remain at about the wartime level and total about 550,000–600,000 short tons, in terms of contained potash (K_2O), or 55–70 percent above the 1939 consumption. Imports, principally into the eastern consuming area, might supply as much as 45–60 percent of apparent consumption and amount to 245,000–360,000 short tons, or 160–285 percent above the more normal 1938 level. Assuming a 10–15 percent increase in foreign

prices over 1939, the foreign value of imports might amount to 16-25 million dollars. If these levels of consumption and imports should actually be realized, then production for the domestic market would be within the range of 190,000-355,000 short tons, with a value of 7-13.1 million dollars at \$37 per ton.

Exports

In the years immediately preceding the war, United States producers exported potassic fertilizer materials, averaging about 50,000 short tons, in terms of contained potash (K_2O). In 1939, however, United States exports of fertilizer potash rose to 82,000 short tons, valued at 4.5 million dollars. Exports were principally to Japan and western Canada, where United States producers had a transportation advantage over European. The principal post-war market is likely to be Japan, which imported 25,000-35,000 short tons of contained potash (K_2O) annually from the United States before the war, and Canada, which imported 20,000-25,000 short tons. In 1943, United States export allocations of fertilizer potash amounted to 75,000 tons of which 36,000 tons were shipped to the United Kingdom, 35,000 to Canada, and 4,000 to Latin America.

Post-war short term.

The effects of the cartel are not likely to be felt immediately after the war, and exports may be expected to increase to about 90,000-100,000 short tons, in terms of contained potash (K_2O), valued at 5-6 million dollars. This quantity would be about 10-20 percent above the 1939 exports and 80-100 percent above the pre-war average.

Post-war long term.

Should the Potash Cartel be active as before the war, international competition is likely to be very severe, and exports of fertilizer potash might be cut to about 20,000-25,000 short tons in terms of contained potash (K_2O), with Canada as the principal market. Should the cartel not be operative, exports might be considerably greater.

Employment

The number of wage earners employed by the potash industry was 1,516 in 1939 and increased to about 2,600 in 1943. With the 75 percent increase in national income, employment might be about 2,000 wage earners.

VARNISH RESINS

Tariff paragraph: 1686

Commodity: Damar, kauri, copal (including kongo, manila, East India, animi, acerodies, yacca).

Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	41, 893
Value (\$1,000).....	2, 036
Unit value (per pound).....	\$0. 048

¹ Foreign value.

Damar and copal are generic terms used to designate groups of natural resins with kauri usually being considered as a copal. Damar, kauri, and copal are usually referred to as the principal natural varnish resins. These resins, exudations of trees of many different genera and species, may be from living trees or the fossilized products of trees long dead. Damars are soluble in alcohol and the common lacquer solvents; the copals, in general, are insoluble in alcohols but after suitable heat treatment are soluble in drying oils. These resins are used principally in the manufacture of spirit and oil varnishes and lacquers.

Although the synthetic resins are used in oil varnishes and lacquers and have shown a greater growth in these uses than the natural resins, the latter are extensively used alone or with the synthetic resins to impart desirable qualities; furthermore, the natural resins are cheaper than the synthetic. It is expected that the former, principally because of their cheapness, will be in demand after the war and will share in the increased use of varnishes and lacquers.

There is no domestic production of these natural resins.

United States imports of damar came principally from British Malaya and the Netherlands Indies; imports of kauri came almost entirely from New Zealand; and imports of copal came chiefly from the Netherlands Indies, Belgium (reexports), and the Philippines. Since the war, imports of damar have ceased; imports of kauri have been reduced drastically, and imports of copal have been reduced sharply, most of it coming from the Belgian Congo.

No post-war difficulty in reestablishing the resin industry in British Malaya, the Netherlands Indies, and the Philippine Islands is anticipated since the resin is obtained principally from wild trees in areas accessible only to natives. The cleaning, sorting, and grading require very little equipment and are carried out chiefly by natives.

POST-WAR SHORT TERM

In the post-war short term, consumption and imports of damar, kauri, and copals probably will be above the 1939 level because of the deferred civilian demand for varnishes and lacquers.

POST-WAR LONG TERM

Consumption, Production, and Imports

Consumption of damar, kauri, and copal combined, increased from 1931 to 1939 and fluctuated with business activity and national income. Imports will continue to supply the entire consumption.

Per capita income at 1939 level.

Consumption and imports might be at about the 1939 level or 42 million pounds, with a foreign value, at 1939 prices, of 2 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption and imports might be about 150 percent of the 1939 level, or about 63 million pounds, with a foreign value, at 5.4 cents per pound, of 3.4 million dollars.

TRAGACANTH, KADAYA, AND TRAGASOL

Tariff paragraph: 1686.

Commodity: Tragacanth, kadaya, talka, and tragasol gums.

Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	14, 919
Value (\$1,000).....	1 2, 290
Unit value (per pound).....	\$0. 154

¹ Foreign value.

Tragacanth, kadaya or karaya, talka, and tragasol gums are not produced in the United States. Except for kadaya, which comes chiefly from British India, these products are imported from the Near East and Mediterranean areas.

They are of plant origin, differing from varnish gums and gum resins in that they form mucilaginous colloids in water. They are used principally in the preparation of foods, pharmaceuticals, cosmetics, other toilet goods, adhesives, mucilages, and leathers, and in textile finishing and printing. For most of these uses, the several gums are used interchangeably and encounter competition from other materials, both foreign material such as arabic gum, and from domestic materials such as gelatin.

The imports in the 6 years 1935-40 of kadaya (including small quantities of talka), tragasol, and tragacanth averaged almost 11.6 million pounds annually. In 1939, total imports of these three gums amounted to about 15 million pounds or 29 percent above the 6-year average. Of the total imports during 1935 to 1940, kadaya (including talka) accounted for slightly over half, and tragasol and tragacanth accounted for about one-fourth each. Kadaya, tragasol, and tragacanth will probably be imported in the future in about the same relative quantities. In past years, the unit value of imports of tragacanth has been on the average over three times as much as kadaya or tragasol.

Reexports of these gums are believed to be negligible, and consumption approximates imports.

POST-WAR SHORT TERM

During the first few years following the war, imports of the gums being considered are likely to be slightly higher than in 1939, owing to increased sales of manufactured consumer goods containing them.

POST-WAR LONG TERM

Imports and Consumption

United States imports of these gums in 1939 were considerably above normal because of the accumulation of stocks in anticipation of the danger of war.

Per capita income at 1939 level.

Imports of these gums in the early 1950's may range from 15 percent below to 10 percent above the imports in 1939. Imports would

total 13-16 million pounds annually, with a foreign value of about 2-2½ million dollars, at 1939 prices.

Per capita income 75 percent higher than in 1939.

The consumption of kadaya, tragasol, and tragacanth gums might be about 50 percent greater than in 1939 and amount to about 22.5 million pounds annually, with a foreign value, at an average price of 17 cents per pound, of about 3.8 million dollars.

CRUDE CHICLE

Tariff paragraph: 1686.
Commodity: Crude chicle.
Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds)-----	14, 679
Value (\$1,000)-----	5, 151
Unit value (per pound)-----	\$0. 351

¹ Foreign value.

There is no domestic production of crude chicle, and imports have been free of duty since 1930. For the last 18 years there have been no imports of processed chicle, which is dutiable at 5 cents per pound. Most of the United States imports come from Mexico with less important quantities from Guatemala and British Honduras.

The principal use of chicle is in the manufacture of chewing gum. Chewing gum, on a weight basis, averages about 22 percent chewing-gum base, the remainder consisting of materials such as sugar, glucose, and flavoring. In the United States, the base is usually made up of about 50 percent chicle and 50 percent of other gums, resins, etc., which are included to obtain certain desired effects in the gum base and to extend the chicle. These extenders, which are less expensive than chicle, include jelutong, hangkang, Perillo, leche caspi, chilte, hydrogenated oils, several of the guttas, and synthetic latex.

Imports of chicle for the years 1937-40 averaged 11,406,804 pounds annually, but in 1939 they were about 30 percent greater. A change in the present rate of duty on chicle, advanced in value, would not affect imports of crude chicle, since it is duty-free.

POST-WAR SHORT TERM

Imports during the first few years following the war are likely to increase over the pre-war average and may approximate the 1939 imports, which were unusually large for a pre-war year. The increased demand may result from a larger population and greater demand for domestic consumption and for export in the form of chewing gum.

POST-WAR LONG TERM

Imports and Consumption

Per capita income at 1939 level.

Allowing for a 10-percent increase in population, imports of chicle may be from 15 percent below to 5 percent above the unusually high 1939 imports, or about 12.5-15.5 million pounds annually. With a

unit value of about 35 cents per pound, this would amount to 4.4-5.4 million dollars (foreign value).

Per capita income 75 percent higher than in 1939.

Consumption of chewing gum might increase 40 percent over the 1939 level. This consumption would require about 20 million pounds of chicle providing the chewing-gum formulas remain approximately the same. Although information as to potential production in Central America is not available, it is quite doubtful whether as much as 20 million pounds would be available year after year. It might be possible, therefore, that manufacturers of chewing gum would be forced to greater use of chicle extenders. With this limitation in mind, imports of chicle might increase 20-40 percent over the 1939 level, or to 17.5-20.5 million pounds annually. At 40 cents per pound, imports would amount to a value of 7.0-8.2 million dollars (foreign value).

Exports

There are no exports of crude chicle although considerable amounts of chewing-gum base, as well as chewing gum, are exported.

CRUDE IODINE

Tariff paragraph: 1698.
Commodity: Iodine, crude.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 350	1 20	330	200	530	Percent 88
Value (\$1,000).....	382	21	361	\$ 168		
Unit value (per pound).....	\$1.09	\$1.09	\$1.09	\$0.84		
Persons employed (number).....	(¹)					

¹ Estimated.
² Foreign value.
³ Less than 100.

Iodine, a purple-black, crystalline solid, is employed chiefly in the production of potassium iodide and antiseptics. Potassium iodide is used in the manufacture of photographic films and papers and is used also as an ingredient in human and animal foods. The crude iodine of commerce is a product averaging 99.6 percent pure elemental iodine. About one-third of the United States consumption of crude iodine is for medicinal purposes and approximately two-thirds for photographic purposes.

In the United States crude iodine is produced principally from the salt brine of petroleum wells. Domestic production normally ranges from one-fifth to one-half the quantity of imports. Almost all imports come from Chile, where iodine is produced as a byproduct in the refining of sodium nitrate from its ore.

In pre-war years imports of crude iodine averaged about 875,000 pounds annually and domestic production about 285,000 pounds, resulting, as exports were very small, in an annual consumption of approximately 1,150,000 pounds. Apparent consumption in 1939 was probably much less than actual consumption; certainly it was much less than normal pre-war consumption. Moreover, the usual pre-war ratio of imports to consumption was about 75 percent compared with 38 percent in 1939. The following discussion of the post-war problems is based on the assumption that imports will supply in the post-war period, as they did in the pre-war period, about 75 percent of United States iodine consumption. Strong price competition on this market from Chilean producers might result in imports supplying a larger percentage. In the past, however, Chilean producers have sent the bulk of their output to other markets and usually have not offered severe price competition on the United States market.

POST-WAR SHORT TERM

In the post-war short term, consumption of crude iodine will probably be several times the abnormally low apparent consumption in 1939, as much as 1.3-1.5 million pounds annually. The increased domestic consumption is estimated on the basis of a use of medicinal iodine products roughly proportional to the increase in population and a temporary 50 percent increase in potassium iodide used in photographic products when wartime restrictions are removed. Imports are likely to be in the neighborhood of 1 million pounds, and as prices are not likely to change from 1939, the foreign value of imports would be about \$800,000-\$900,000. Domestic production would then be about 300,000-500,000 pounds, valued at \$350,000-\$500,000.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

On the assumption that the average annual per capita use of iodine will be about the same as in the later 1930's, United States consumption of crude iodine will at this level of national income probably be 1.2-1.4 million pounds per annum in the post-war long-term period. Imports may supply 900,000-1,050,000 pounds, with a foreign value of \$756,000-\$882,000, at 1939 prices. Domestic production would supply 300,000-350,000 pounds, with a value of \$327,000-\$382,000, at 1939 prices.

Per capita income 75 percent higher than in 1939.

It seems likely that with national income at this high level consumption of crude iodine in the United States will be 1.4-1.6 million pounds. This assumes an increase in the use of iodine medicinals in proportion to the larger population of the country at that time and an increase in the use of potassium iodide for photographic purposes in proportion to the larger national income.

On this assumption, imports would be about 1,100,000 pounds, with a foreign value of about \$1,050,000, at 95 cents a pound. United States production would be likely to be 350,000-550,000 pounds, having a value of \$400,000-\$635,000, at \$1.15 per pound.

Employment

There have been no important changes in the productive processes of crude iodine during the war period. The small number of persons employed in 1939 by domestic manufacturers may probably be 25-35 percent higher in the immediately post-war period and 10-20 percent higher in the post-war long-term period. The number of employees may not be more than 100 in either of these periods.

LAC

Tariff paragraph: 1707.
Commodity: Lac.
Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	51, 033
Value (\$1,000).....	1 3, 620
Unit value (per pound).....	\$0. 071

1 Foreign value.

Crude lac or stick-lac is a resinous incrustation produced by certain insects on the twigs of various species of trees in British India and neighboring countries. Seed lac is made by first scraping the raw lac from the twigs and grinding, washing, and then drying this material. Seed lac is further treated by heating and straining the semifluid mass through woven cotton bags to produce shellac and button lac. Shellac or other crude lacs are bleached with sodium hypochlorite to produce bleached shellac.

The principal uses of lacs and shellac are in the manufacture of spirit varnishes and in the production of phonograph records; each of these uses accounted for about one-third of consumption in the period 1935-39. Shellac is used also in molded parts and insulating coatings on electrical goods, in molded articles such as buttons, dominoes and poker chips, in sealing wax, leather and shoe dressings, liquid floor polishes, sizings for hats, and antifouling paints.

In some of its uses, especially in the manufacture of molded products and as electric insulating coatings, shellac competes with certain synthetic resins even though the latter are more expensive. A new product similar to shellac, produced from eorn gluten, has been used during the war, but it is not expected to offer serious competition to shellac when peacetime trade conditions are reestablished.

Most of the world output of crude lac comes from the Indian states just west of Calcutta, which is the principal trading center for this commodity. Outside India only very small amounts are produced, chiefly in Ceylon, the Netherlands Indies, Indochina, and Thailand, and practically all of this crude lac is sent to Calcutta.

Production of crude lacs and shellac in British India varies considerably from year to year, but in the period 1935-39 it averaged about 72 million pounds annually. Almost all of the Indian output is exported.

United States imports of lac are in the crude state and as unbleached and bleached shellac. During the period 1935-39, imports of crude lac averaged 16.6 million pounds annually at a foreign unit value of 8 cents a pound; imports of unbleached shellac averaged 19 million pounds a year at a foreign value of 10 cents per pound; and imports of bleached shellac averaged 279,000 pounds at a foreign value per pound of 17½ cents—a total of almost 36 million pounds of all lacs. Imports of crude lacs and shellac, probably for building up inventories, amounting to 51 million pounds during 1939, were, therefore, unusually high. The United States produces no crude lac. Domestic production of bleached shellac in 1939, using crude imported lacs as raw material, was slightly over 16 million pounds at a value of 19½ cents a pound.

United States imports of crude lac and unbleached shellac came almost entirely from British India; imports of bleached shellac came chiefly from Germany.

POST-WAR SHORT TERM

United States consumption of lacs and shellac will probably increase considerably as domestic use of these products during the war has been restricted primarily to the manufacture of military supplies. Consequently imports of crude lac and unbleached shellac from British India are likely to exceed the pre-war average by a considerable amount. Imports of bleached shellac are expected to be small.

POST-WAR LONG TERM

Consumption and Imports

Consumption of crude lacs and shellac in the United States has varied with the national income.

Per capita income at 1939 level.

Imports of crude lacs and shellac might amount to about 38 million pounds, with a foreign value of about 3.5 million dollars. Probably 18 million pounds, with a foreign value of about 1.44 million dollars, at about 8 cents a pound, will be crude lacs and probably about 20 million pounds, with a foreign value of about 2 million dollars, at 10 cents a pound, will be unbleached shellac. Imports of bleached shellac might amount to about the pre-war average of 280,000 pounds, with a foreign value of \$49,000 (17.5 cents a pound).

Per capita income 75 percent higher than in 1939.

As more shellac is likely to go into surface coatings and phonograph records, United States imports of crude lacs and shellac will probably amount to about 52 million pounds, with a foreign value of about 5.4 million dollars. Imports of crude lacs will probably be about 20 million pounds, with a foreign value of about 1.8 million dollars at 9 cents a pound, and imports of unbleached shellac will probably be about 32 million pounds, with a foreign value of about 3.5 million dollars, at 11 cents a pound. Imports of bleached shellac might be 400,000 pounds, with a foreign value of \$80,000 at 20 cents a pound.

ASPHALT

Tariff paragraph: 1710.

Commodity: Asphaltum and bitumen.

Rate of duty: Free (but subject to an import-excise tax of $\frac{1}{2}$ ¢ per gal. on liquid petroleum asphalt). *Equivalent ad valorem (1939): 0%* (see note).

Note.—No duty was imposed by the Tariff Act of 1930. The Revenue Act of 1932 (Internal Revenue Code, sec. 3422) imposed an import-excise tax of $\frac{1}{2}$ cent per gallon on liquid petroleum asphalt. In 1939, however, there were no imports of liquid asphalt. This tax was reduced to $\frac{1}{4}$ cent per gallon, effective January 30, 1943, pursuant to the trade agreement with Mexico.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 long tons).....	4,720	191	4,529	66	4,595	Percent 1.4
Value (\$1,000).....	43,969	3,675	40,284	1,552		
Unit value (per ton).....	\$9.31	\$19.24	\$8.90	\$8.86		

¹ Foreign value.

² Exports are, on the average, of much higher grade than either production or imports.

Asphalt and bitumen comprise a wide variety of materials, petroleum-derived and natural. About 90 percent of domestic production is made at petroleum refineries; most of the remainder is bituminous rock.

Imports consist mainly of natural lake asphalt from Trinidad and petroleum asphalt from the Netherlands West Indies and Mexico. From 1932-42 imports of liquid petroleum asphalt were subject to an import-excise tax (duty) of $\frac{1}{2}$ cent per gallon (\$1.30 per long ton); since 1943, the tax has been $\frac{1}{4}$ cent per gallon (\$0.65 per long ton). Natural asphalt and solid petroleum asphalt are free of tax or duty.

Principal uses of asphalt are for paving, roofing, and waterproofing.

POST-WAR SHORT TERM

Demand for asphalt immediately after the war will probably be materially larger than in 1939. Road construction and maintenance, which have lagged since 1941, seem likely to require large quantities of asphalt. Residential construction, which is also an important consumer of asphalt, is expected to boom when materials and labor are available.

Domestic production will probably increase over 1939 approximately in proportion to consumption, so that the volume of imports may not change materially.

POST-WAR LONG TERM

Consumption, Production, and Imports

In the past, consumption of asphalt has tended to vary with national income and general business conditions. This relation may not

necessarily hold in the post-war period. A large part of the asphalt is used for public works, especially roads. If National, State, and local government authorities should pursue the policy of increasing public expenditures to offset decreases in private income, the consumption of asphalt in public works might move in the direction opposite to that of national income.

Most of the United States production of asphalt is derived from crude petroleum. The output of petroleum asphalt depends upon the volume of crude petroleum refined, and also upon the percentage of recovery of asphalt from the oil, which in turn is influenced by the price of asphalt. It may be assumed, therefore, that the production of asphalt will be adjusted fairly well to the demand, so that increased demand would not necessarily mean an increase in the proportion of imports in the consumption.

Petroleum asphalt is made in all degrees of hardness, and the distinction between liquid and solid is technical. There has been no regularity in the relative proportion of imports of liquid petroleum asphalt to total imports of petroleum asphalt. The reduction in tax might encourage imports of liquid asphalt and an increase in the tax might discourage them. However, it is doubtful whether any change in the tax would greatly affect total imports of asphalts after the war.

Per capita income at 1939 level.

It seems probable that even with no increase in per capita income the volume of construction of residences, roads, and other works consuming asphalt will be materially above the 1939 level. Taking into account an increase in population, the consumption of asphalt might be 40-60 percent greater than in 1939, amounting to 6.5-7.5 million tons. Production would therefore probably increase by nearly the same quantity and the price would probably be considerably higher than in 1939, say \$11 to \$12 per ton. On these assumptions the value of production would be 75-90 million dollars. Imports would probably represent no larger fraction of consumption than before the war; they might be 100,000-150,000 tons, with a foreign value, at prices somewhat higher than in 1939, amounting to 1.1-1.6 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption would probably be only moderately greater at this level of income than with no change in per capita income. Assuming it to be around 10 percent greater, consumption might be 7.0-8.5 million tons. Production would still be nearly equal to consumption and the unit value would probably be appreciably higher than with no increase in income. It might be \$13-\$14 per ton, in which case the value of production would be 90-110 million dollars. Imports under these conditions might be 125,000-200,000 long tons, with a value, at somewhat higher prices than with unchanged income, amounting to perhaps 1.6-2.5 million dollars.

Exports

Exports might increase moderately in line with production to the neighborhood of 250,000 tons, valued at 5-7 million dollars, assuming a unit value of \$20-\$28 a ton.

Employment

The petroleum-refining industry produces a number of commodities simultaneously from a single raw material; asphalt is one of the less important products. The number of workers in the refineries depends primarily on the quantity of crude oil processed, not on the output of any one product such as asphalt.

ERGOT

Tariff paragraph: 1728.
Commodity: Ergot.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total (est.)	For export	For domestic market			
Quantity (1,000 pounds).....	25		25	98	123	Percent 79
Value (\$1,000).....	41		41	1 148		
Unit value (per pound).....	\$1.64		\$1.64	\$1.514		
Persons employed (number).....	(¹)					

¹ Foreign value.

² Less than 50.

Ergot is a crude botanical drug, occurring as a fungus growth on almost all cereal grains, principally on rye. The crude drug contains approximately 0.05 percent of active alkaloids, the most important of which are ergotamine, ergotoxine, and ergonovine. Ergot, in the form of a fluid extract, and its alkaloids, are important medicinals in obstetrics. Small quantities are used as medicinals for migraine headaches.

In the United States ergot occurs sporadically in rye-growing sections, particularly in Minnesota, the Dakotas, and adjacent States. As the separation of ergot from rye-mill screenings or other grains requires extensive hand labor, there is no production in the United States unless the price of the crude drug is high. United States output in 1939 was about 25,000 pounds, valued at approximately \$41,000, or \$1.64 per pound. Domestic production before 1939, when the average price was about 65 cents a pound, was negligible.

United States imports of 98,000 pounds of ergot in 1939 were abnormally low. During 1936-40, they averaged 207,000 pounds, and during 1926-35, they averaged 253,000 pounds. The ergot alkaloids imported under tariff paragraphs 5 and 23 during 1939 were roughly equivalent to an additional 20,000 or 25,000 pounds of crude ergot.

Imports of crude ergot have come principally from Portugal. Most of the alkaloids have come from Switzerland.

There are no exports of crude ergot.

POST-WAR SHORT TERM

United States consumption of ergot after the war will probably be near the pre-war averages. Most of the increased consumption will be reflected in larger imports of the crude drug. It is not expected that domestic production will be continued long after the end of the war because of competition with the cheaper crude drug from European countries.

POST-WAR LONG TERM

Consumption of ergot, both as the crude drug and its alkaloids, is directly proportioned to the birth rate in the United States. Improved production processes by domestic medicinal manufactures are expected to increase domestic output of the ergot alkaloids and to require imports of crude ergot. There will probably be no domestic production of crude ergot.

Per capita income at 1939 level.

Imports of crude ergot will probably be about 300,000 pounds, with a foreign value of \$195,000, at 65 cents per pound.

Per capita income 75 percent higher than in 1939.

Imports of crude ergot will probably be about 350,000 pounds, with a foreign value of \$250,000, at 72 cents per pound.

RADIUM SALTS

Tariff paragraph: 1749.
Commodity: Radium salts.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (grams).....	1.5		1.5	78.6	80	Percent 98
Value (\$1,000).....	(?)		(?)	1,954		
Unit value (per gram).....				\$24,848		

¹ Estimated.
² Sales into consumption channels. The bulk goes into medical uses where it lasts indefinitely. Amount destroyed in consumption estimated at about 8 grams.
³ Not available.
⁴ Foreign value.

Radium is a rare material obtained from pitchblende and carnotite ores. There are only two important sources of radium-bearing pitchblende, the Great Bear Lake Region of Canada and the Belgian Congo; Czechoslovakia is a minor source. The United States has radium-bearing carnotite ore with an average content of about 1 gram of radium to 500 tons of ore. World production of radium in 1939 is estimated at from 40 to 50 grams; statistics of United States production are not available, but it was probably between 1 and 2 grams in that year. In 1939, imports of radium salts were abnormally high owing to stock-piling because of unsettled world conditions and the impending war in Europe; these imports were approximately four times the average of 1933-38 which was about 20 grams per year.

Normal use of radium before World War II was approximately 85 percent for medical purposes, chiefly in cancer therapy; 10 percent for luminous paints for dials of watches and other instruments; and 5 percent for miscellaneous uses. Only the use for luminous paints, which usually required between 7 and 9 grams per year, resulted in an actual consumption of radium. In other uses, radium salts last indefinitely.

POST-WAR SHORT TERM

No important changes in domestic production of radium are in prospect for the first few years after the war. In view of the fact that 1939 imports of radium represented substantial stock-piling for use in the defense program, short-term post-war imports may not be higher than 40 percent of the 1939 imports, or about 30 grams annually.

POST-WAR LONG TERM

Institutional facilities for treating cancer and related diseases are likely to be largely increased after the war, but the availability of satisfactory substitutes may decrease the sale of radium salts if these substitutes are widely adopted by the medical profession. The cyclotron will probably have attained wide-scale use, making radioactive preparations useful in cancer therapy available at a small fraction of the cost of radium, which in 1939 was about \$25,000 per gram. The costs of concentrating and refining these salts are so high that it is difficult to see how the price of radium can be reduced sufficiently to compete with these substitutes in medical uses.

It therefore seems likely that the consumption and imports of radium salts will not be over 25 percent of those shown for 1939— or about 20 grams—and that domestic production may have ceased entirely. The value of such imports will probably be about \$400,000. The availability of possible substitutes rather than the national income will determine the post-war trade.

SULFUR AND PYRITES

Tariff paragraph: 1777.
 Commodities: Sulfur and pyrites.
 Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 long tons sulfur):						Percent
Sulfur (native).....	2,091	653	1,438	14	1,452	1
Pyrites sulfur.....	220		220	216	436	89
Total.....	2,311	653	1,658	230	1,888	12
Value (\$1,000):						
Sulfur, native.....	\$3,236	11,988	21,544	1,350	\$1,794	
Pyrites sulfur.....	1,600		1,600	1,315	3,675	
Unit values (per long ton):						
Sulfur, native.....	\$15.89	\$17.89	\$14.98	\$17.89		
Pyrites sulfur.....	\$7.09		\$7.09	\$8.09		
Persons employed (number).....	1,369					

¹ Foreign value.
² Pyrites contains 42 to 47 percent sulfur combined with iron and other material. Its value per ton of sulfur content is not comparable with the unit values of native sulfur.
³ Native sulfur only. Employment data are not available for pyrites which is obtained almost exclusively as a byproduct by companies engaged primarily in the recovery of metals from their ores, or in the production of coal.

Sulfur occurs in nature as native sulfur, and as combined sulfur. The most important source, other than native sulfur, is pyrites, which is a combination of sulfur and other minerals. The most important use of both native sulfur and pyrites is in the manufacture of sulfuric acid. In many of the other uses of sulfur, pyrites cannot be used. About 80 percent of United States consumption of sulfur is supplied by domestic native sulfur; the remaining 20 percent by pyrites, about half of which is imported. It costs much more to produce sulfuric acid from pyrites than from natural sulfur. Nevertheless, pyrites are also used because it pays some acid plants, originally designed to use pyrites, to continue to do so rather than shut down or undergo extensive redesigning. Because of the multiplicity of uses of sulfur and its compounds in the chemical and wood-pulp industries, and in agriculture, consumption of sulfur in the United States tends to vary from year to year with fluctuations in the national income, but in the long term the consumption tends to increase with the increase in population.

The United States is the world's greatest source of native sulfur and exports one-quarter to one-third of its production.

United States imports of sulfur usually consist only of pyrites but in 1939 a small amount of native sulfur was also imported. Spain, Canada, and Portugal have been the principal sources of imports.

POST-WAR SHORT TERM

It is probable that consumption of sulfur in the United States shortly after the war will be considerably greater than it was in 1939. This increase is likely to be filled mainly by greater production of native sulfur and partly by slightly increased imports of pyrites.

POST-WAR LONG TERM**Consumption, Production, and Imports***Per capita income at 1939 level.*

Consumption of sulfur in the United States might be in the neighborhood of 2.0 million long tons, of which perhaps 1.6 million long tons might be native sulfur and about 400,000 long tons in the form of pyrites.

United States imports of pyrites might be about 465,000 long tons (200,000 long tons of sulfur) with a foreign value of about 1.3 million dollars at 1939 prices. There are not likely to be any imports of native sulfur. Imports of pyrites are therefore likely to supply about 10 percent of the sulfur consumption.

United States production for the domestic market might be about 1.6 million long tons of native sulfur, valued at about 24 million dollars at 1939 prices, and about 480,000 long tons of pyrites (200,000 long tons of sulfur), valued at about 1.4 million dollars at 1939 prices.

Per capita income 75 percent higher than in 1939.

Consumption of sulfur in the United States might be around 3 million long tons, of which perhaps 2.3 million long tons might be native sulfur and about 600,000 long tons in the form of pyrites.

Imports of pyrites might be about 675,000 long tons (290,000 long tons of sulfur), with a foreign value of about 2 million dollars, at \$7.00 a ton of contained sulfur. There are not likely to be any imports of native sulfur. Thus, imports will probably supply about 10 percent of the sulfur consumed.

United States production for the domestic market might be about 2.3 million long tons of native sulfur, valued at 39.1 million dollars, at \$17 a ton, and about 744,000 long tons of pyrites (310,000 long tons of sulfur), valued at about 2.5 million dollars, at \$8.00 a ton of contained sulfur.

Exports

The United States exported 30 percent of the native sulfur produced in 1939. Post-war exports of native sulfur might range from half a million long tons, valued at 9 million dollars (1939 prices), to 1 million tons valued at 20.5 million dollars, if prices were 15 percent higher. The United States has exported no pyrites in the past, and probably will not in the post-war period.

Employment

The number of persons employed in the production of native sulfur in 1939 was 1,369. The production of sulfur is so highly mechanized that post-war increases in production for consumption and export might not increase the number employed. In 1943, 20 percent more sulfur was produced than in 1939 with 8 percent fewer employees.

IMPURE TEA, TEA WASTE, AND TEA SIFTINGS*Tariff paragraph:* 1783 (a).*Commodity:* Impure tea, tea waste, and tea siftings.*Rate of duty:* Free.**GENERAL**

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	7,798
Value (\$1,000).....	1,215
Unit value (per pound).....	\$0.0276

¹ Foreign value.

Impure tea, tea waste, siftings and sweepings are unfit for beverage purposes. This material, which has an average caffeine content of about 2 percent is imported for the purpose of extracting the caffeine. There is no domestic production; imports come principally from British India. Smaller quantities have been received from the United Kingdom, Japan, and the Netherlands Indies.

Imports of tea waste vary widely from year to year, but over a long period have averaged about 6 million pounds per annum; therefore, imports in 1939 were about one-third above the average. Imports have continued during the war, averaging about 8 million pounds annually. The price of tea waste is usually between 2 and 3 cents a pound, depending on its caffeine content.

POST-WAR SHORT TERM

Imports of tea waste in the immediate post-war period will probably depend on its availability but may be about 7.5 million pounds.

POST-WAR LONG TERM**Imports**

As the United States takes practically the entire available supply of tea waste, imports will be roughly proportional to the production of tea in the supplying countries.

Per capita income at 1939 level.

Imports of tea waste will probably be 6-7 million pounds, with a foreign value of \$150,000-\$175,000, at an average value of 2½ cents a pound.

Per capita income 75 percent higher than in 1939.

Because of a probable larger production of tea at this higher level of income, the available waste tea may be proportionately larger. Imports of tea waste may be as much as 9 million pounds. At a unit value of 3 cents per pound, this quantity would have a foreign value of \$270,000.

URANIUM OXIDE AND SALTS

Tariff paragraph: 1792.
 Commodity: Uranium oxide and salts.
 Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 70		70	1, 430	1, 500	Percent
Value (\$1,000).....	3 70		(1)	1, 198		98
Unit value (per pound).....	\$ 1.00			\$0. 83		

¹ There are no statistics available for domestic production of uranium compounds. The figure is the quantity of uranium oxide contained in ores mined in the United States as reported in the *Minerals Yearbook*, U. S. Bureau of Mines.

² Estimated.

³ Not available.

⁴ Foreign value.

Uranium oxide and salts are byproducts of the production of radium from pitchblende and carnotite ores. More recently uranium compounds have been obtained in connection with the recovery of vanadium from carnotite ores. There are only two important sources of pitchblende—the Great Bear Lake Region of Canada and the Belgian Congo.

In peacetime the principal uses for uranium oxide and salts are as a coloring material for ceramic ware, glass products, and paint pigments. Small quantities are normally used as laboratory reagents, in photography, and in textile dyeing. Starting in 1938, significant quantities of uranium compounds were consumed in the domestic manufacture of fluorescent-lighting tubes. Although the future of this type of lighting is promising, it is difficult to foretell to what extent uranium compounds will be used in manufacturing the tubes, in view of the continuing research aimed at developing a less-expensive substitute for this material.

In the United States, carnotite ore, found principally in Arizona, Colorado, and New Mexico, was the source of small amounts of uranium compounds until 1940. During the war unusually large quantities of carnotite have been processed primarily to obtain increased quantities of vanadium for war purposes. This has resulted in an abnormally large production of uranium compounds. After the war, with the probable decline in the demand for vanadium, the processing of carnotite will probably be reduced to something like peacetime levels with a corresponding reduction in the domestic production of vanadium compounds.

Before the war the bulk of United States requirements of uranium compounds were imported and until the outbreak of the war came principally from Belgium. The average annual consumption for the 5 years, 1933–37 was 254,000 pounds, of which about 237,000 pounds were imported at an average foreign value of \$1.16 per pound. In 1938 the apparent consumption was 438,000 pounds, of which 377,000

pounds were imported, at a foreign value of \$1.38 per pound. In 1939 the apparent consumption was 1,509,000 pounds, of which 1,409,000 pounds were imported at a foreign value of \$0.83 per pound. Imports of these compounds in 1939 were abnormally high chiefly owing to stock-piling for anticipated industrial and military requirements.

POST-WAR SHORT TERM

Allowing for some deferred demand for use in producing luxury glass and ceramic wares, it seems likely that consumption of uranium compounds in the first few years following the war will be somewhat greater than in 1938 but only about one-third of the abnormally high consumption of 1939. Production of uranium compounds in the United States is likely to be small; imports will probably furnish most of the domestic requirements.

POST-WAR LONG TERM

Consumption, Production, and Imports

In view of the uncertainty of the extent to which uranium compounds will be used in the manufacture of fluorescent-lighting tubes, it is difficult to predict the future over-all consumption. If this use should continue, then the 1938 level of consumption should be used as a basis for determining the course of future consumption.

Per capita income at 1939 level.

With a 10-percent increase in population, annual consumption of uranium compounds in 1953 would probably be 400,000–500,000 pounds. Domestic production of uranium compounds, which has been greatly expanded during the war because of the increase in vanadium refining, will probably decline to a peacetime level of about 50,000 pounds per year, with a value of about \$50,000, at \$1 per pound. Imports, therefore, would be 350,000–450,000 pounds, with a probable foreign value of \$350,000–\$450,000, assuming a unit value of approximately \$1 per pound.

Per capita income about 75 percent above 1939.

A high national income will greatly increase the demand for luxury glass, ceramic wares, and fluorescent-lighting tubes. It is probable, therefore, that the consumption of uranium compounds would be 450,000–600,000 pounds. This quantity represents an increase of 5–35 percent over the fairly representative 1938 consumption. It seems likely that most of this consumption will be furnished by imports. Domestic production is not likely to be more than 50,000–100,000 pounds a year since domestic wartime operations for recovery of vanadium will probably be found uneconomic in times of peace. At \$1.20 per pound, this production would have a value of about \$60,000–\$120,000. If this assumption should prove correct, then imports may be expected to be 350,000–550,000 pounds, with a foreign value of \$420,000–\$660,000, assuming a unit value of \$1.20 per pound.

Employment

The number of employees engaged in the manufacture of uranium compounds is very small; in the post-war period it is not expected to be significantly larger than before.

VEGETABLE WAXES

Tariff paragraph: 1796.

Commodity: Carnauba, Japan, candelilla, ouricury, and other vegetable waxes.

Rate of duty: Free.

GENERAL

Data on United States imports less reexports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	24,380
Value (\$1,000).....	15,831
Unit value (per pound).....	\$0.24

¹ Foreign value.

Vegetable waxes include carnauba, candelilla, Japan, ouricury, and others. As none of these waxes are produced to an appreciable extent in the United States, imports approximate consumption.

About 75 percent of the vegetable waxes are consumed in making polishes for floors, furniture, automobiles, shoes, and leather, and 25 percent in making carbon paper, water-proofing compounds, cosmetics, candles, electrical insulation, and in other uses. Before the war, the rate of increase in consumption of vegetable waxes was about double that of the rate of increase in national income, probably owing in part to increased demand for consumer goods requiring polishes.

Recently, synthetic organic waxes have been developed which may be substituted for or mixed with carnauba and other vegetable waxes for special purposes. These do not seem likely to displace vegetable waxes for general purposes, but their different physical properties frequently make them more suitable for certain special uses.

Carnauba wax, produced exclusively in Brazil, is the most important of all waxes used in polishes and accounts for about 70 percent by quantity and 85 percent by value of United States consumption of vegetable waxes. Though higher priced than other natural waxes, carnauba is preferred on a quality basis. Candelilla wax, produced exclusively in Mexico, and Japan wax, produced exclusively in Japan, accounted for about 10 to 15 percent each by quantity of vegetable-wax consumption in the years preceding the war. Consumption of Japan wax has been decreasing in relation to that of other vegetable waxes, whereas consumption of candelilla wax has been increasing. Consumption of ouricury wax, produced exclusively in Brazil and first imported into the United States in 1937, has been increasing rapidly; it was 3 million pounds in 1943. Other vegetable waxes are: Chinese insect, Cochin China, bayberry, and fiber.

POST-WAR SHORT TERM

During the first few years after the war, consumption of vegetable waxes might equal or exceed the wartime consumption of 32 million pounds; decreased use of military polishes might be compensated for by increased civilian consumption.

It is doubtful whether there will be large imports of waxes from Japan or China during this period, but increased imports of other vegetable waxes, especially ouricury, will probably compensate for this loss.

POST-WAR LONG TERM

Per capita income at 1939 level.

Carnauba will continue to be the most important vegetable wax. It may be assumed that imports of Japan wax will again be available, but it is doubtful whether these imports will be as large as before the war; on the other hand, imports of candelilla and ouricury waxes will probably increase considerably. With a national income per capita at the 1939 level and population increased by 10 percent, there might be an increase in consumption (and imports) of all vegetable waxes of about 10 percent, or to about 27 million pounds, with a foreign value of about 6.5 million dollars, at 1939 prices.

Per capita income 75 percent higher than in 1939.

There might be a 50-100 percent increase in consumption of vegetable waxes or to 35-50 million pounds. At 30 cents per pound imports would have a foreign value of 10.5-15.0 million dollars.

BEESWAX, CRUDE

Tariff paragraph: 1796.
Commodity: Beeswax, crude.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 3,000	0	1 3,000	4,667	7,667	Percent 59
Value (\$1,000).....	1 750		1 750	2 904		
Unit value (per pound).....	1 \$0.25		1 \$0.25	\$0.193		

1 Estimated.
2 Foreign value.

Beeswax is produced in almost every country in the world. In the United States before the war, beeswax was collected only from the larger apiaries. Domestic production has not been large enough to supply domestic consumption and has not been above 4 million pounds annually in recent years. About 60 percent of the crude beeswax consumed annually has been imported, principally from South America and Africa. Although consumption of other waxes, such as vegetable waxes, has increased rapidly since 1932, there has been only a slight increase in consumption of beeswax. This is probably due to a growing preference for vegetable waxes.

It is estimated that half of the beeswax consumed in the United States is for cosmetics and medical uses, one-fourth for candles, and one-fourth for miscellaneous uses such as polishes, carbon paper, molding compounds, and food treatment.

POST-WAR SHORT TERM

It seems likely that United States consumption of crude beeswax may increase 10 percent over 1939. Although domestic production of beeswax may form a somewhat larger percentage of consumption than in 1939, if the smaller apiaries collect the wax as many have done during the war, imports are still likely to continue to furnish the major part of consumption.

POST-WAR LONG TERM

Consumption, Production, and Imports

Production of crude beeswax has ranged between 3 and 4 million pounds annually, and it seems probable that production will not go much above 4 million pounds after the war.

Per capita income at 1939 level.

With income at the 1939 level and population 10 percent greater, consumption of crude beeswax might be slightly greater than in 1939, or about 8-9 million pounds. Imports may account for 5.0-5.5 million pounds with a foreign value of \$950,000-\$1,000,000, at 1939 unit values, and United States production for the domestic market may be from 3.0-3.5 million pounds valued at \$750,000-\$875,000, at 1939 prices.

Per capita income 75 percent higher than in 1939.

There might be an increase in consumption of crude beeswax of about 15-25 percent, or to 8.5-10.0 million pounds. Of this quantity imports might supply about 4.5-7.0 million pounds. At 21 cents per pound (a 10-percent increase over 1939), the foreign value of imports might be \$950,000-\$1,500,000. Production might account for 3-4 million pounds, valued at \$825,000-\$1,100,000 at 27.5 cents a pound.

Employment

No statistics are available on the number of persons employed in production of crude beeswax, but the number is believed to be very small, since the wax is obtained as a byproduct of honey production which is frequently a side line for farmers.

MINERAL WAXES

Tariff paragraph: 1796.

Commodity: Montan, ceresin, ozokerite, and other mineral wax, n. s. p. f.

Rate of duty: Free.

GENERAL

Data on United States imports less reexports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	8,011
Value (\$1,000).....	1,835
Unit value (per pound).....	\$0.104

! Foreign value.

Mineral waxes are used for various polishes, water-proofing compounds, electrical insulation, and other purposes. The principal mineral waxes are montan, crude ozokerite, and ceresin (refined ozokerite). Montan wax is the most important, accounting for about three-fourths of the total imports.

Mineral waxes are produced in Europe, principally in Germany and Poland. As they are not produced to any appreciable extent in the United States, imports approximate consumption. Although the United States demand for waxes of all types has steadily increased during the last 10 years, the increase has chiefly been in the consumption of the higher-priced vegetable waxes (such as carnauba) and of petroleum microcrystalline waxes, which are used for the same purposes as mineral waxes.

POST-WAR SHORT TERM

As Germany and Poland are the principal sources of mineral waxes, it may be assumed that there will be little or no imports in the first few years after the war.

POST-WAR LONG TERM

Per capita income at 1939 level.

In the early fifties it may be assumed that imports from Europe will be resumed. Although mineral waxes will probably remain lower in price than carnauba wax, increased imports of carnauba wax together with increased domestic production of synthetic organic and petroleum microcrystalline waxes may result in a decreased consumption of mineral waxes. Imports and consumption might be from 75 to 100 percent of 1939 quantity, or 6-8 million pounds, with a foreign value of \$600,000 to \$800,000 at 1939 prices.

Per capita income 75 percent higher than in 1939.

There would be an increase in the consumption of all waxes, and mineral waxes would probably share in this increase. Under these conditions, consumption of mineral waxes might be 25 percent greater than in 1939, or 10 million pounds. If there were a 10 percent increase in foreign prices, imports of mineral waxes would have a foreign value of about \$1,150,000.

FATS, OILS, AND OIL-BEARING MATERIALS

Part I. Summary

Tariff paragraph: Various.*Commodity:* Fats and oils of all varieties used for all purposes.*Rates of duty:* Free to 14¢ per pound.*Equivalent ad valorem (1939):* 0% to 136% (weighted average including duty-free imports 53%).

NOTE.—Fats, oils, and materials covered by this report were either free of duty or subject to various rates of duty under the Tariff Act of 1930. The Revenue Acts of 1934, 1935, 1936, and 1938 imposed import excise taxes on some commodities and processing taxes on some others, the taxes falling in some cases upon duty-free items and in others upon dutiable items. Reductions in duties or taxes were made on many items pursuant to section 336 of the tariff act (olive oil); trade agreements with Canada, Brazil, United Kingdom, Netherlands, Argentina, and Iceland (various); and under the terms of the act of September 17, 1942 (coconut oil tax).

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	7,729	342	7,387	1,800	9,187	Percent
Value (million dollars).....	1,948	25	921	85		20

¹ Estimated.

² Estimated foreign value.

NOTE.—The statistics with the exception of those on exports, are derived from data on consumption. The consumption of fats and oils obtained wholly from domestic materials is classified above as "production for the domestic market" and the consumption of fats and oils which are either imported or derived from imported materials (including Philippine copra), is classified as "imports." The same practice is followed in all sections of this report dealing with fats and oils.

Demand, Supply, and Consumption

Interchangeability.

Fats and oils of animal and vegetable origin are used in the preparation of (1) food products; (2) soap; (3) paint, varnish, linoleum, and printing inks; and (4) many miscellaneous manufactures. Many fats and oils used in food can be substituted for one another either wholly or in substantial degree; the same is true of many of the fats and oils used in soap and, to a lesser degree, of those used in paint and in miscellaneous manufactures. Some of the oils used principally in food can also be interchanged with those used principally in soap and vice versa; and some oils used in food can even be used in paint and in various miscellaneous products. Palm oil, for example, is used in shortening, margarine, soap, and in the manufacture of tin plate. From a technical standpoint, other oils (domestic and foreign) are just as satisfactory in making shortening, margarine, and most soaps, but apparently not in making tin plate. Soybean oil is used in food, soap, paint, and miscellaneous products, but from a technical standpoint it is a preferred oil in few if any of these uses. Fish oils are used in food, soap, paint, and vitamin preparations. For some purposes, fish oils (i. e. those made from fish livers) cannot be replaced by any other, but in the manufacture of soap, many other fats and oils can replace them.

Other oils used principally or wholly in soap or in paint in the United States are used largely or principally in food in some other countries. For example, many European countries use whale oil in making margarine, but we generally use it almost exclusively in making soap; and the Russians use linseed oil in edible products, but we use it principally in paint. The chief use of coconut oil is for food in some countries and for making soap in others. In the United States coconut oil is used in large proportions both in food and soap and, during the war period, has been used in substantial amounts in the manufacture of synthetic rubber, and to some extent in the manufacture of safety glass, alkyd resins, and lubricant additives.

Notwithstanding the wide technical interchangeability of many fats and oils, there are no satisfactory substitutes for some oils and fats in certain uses. The limiting factors may be price, difficulties in processing, or differences (real or fancied) in the quality of the finished products. For example, the cleansing qualities of most toilet soaps would not actually be impaired by substituting in their manufacture a domestic tallow for an imported palm oil. Many consumers, however, prefer soaps made of palm oil. Strong consumer preferences exist for certain other oils. Many persons so much prefer the taste of olive oil that they will buy it even though it costs several times as much as any other salad oil. Much the same situation prevails in the respective demands for butter and margarine. In the production of certain paints and varnishes, tung oil is technically superior to any other oil, but in the production of other kinds of paints and varnishes, it is not. Many other examples could be cited.

Factors influencing demand.

The demand for any particular oil is influenced not only by the demands for the various products into which it actually enters but also by the demand for products into which it might enter under certain circumstances, either in the United States or elsewhere. For example, lard is generally used only for food, but it can be used in making soap and, in fact, has been so used in the United States during the present war. The demand for soybean oil depends, in the first instance, on the respective demands for each of the various food products, soap, paint, and miscellaneous manufactures into which it enters. Changes in tariff duties and in national income would not result in uniform changes in the demands for each of the finished products into which soybean oil enters or into which most other oils enter. The calculation of the demand for most individual oils, under various assumed conditions, would therefore have to take into account the demand for each of the products—not merely the principal product—into which they might enter. The actual or potential demand for only a few important fats and oils—such as butterfat and tung oil—is governed solely or almost solely by the demand for only a single finished product or class of products.

Factors governing supply.

Fats and oils are obtained by such diverse methods that the production of some is very responsive to price change, whereas the production of others is not at all responsive; and the response in some instances is rapid, and in others slow. For example, the production of cottonseed oil is almost always a function solely of the quantity of cotton produced. As long as the price obtained for the oil is expected

to cover something more than the crushing costs less the value of the oil cake, then the oil will generally be produced and sold for whatever it will bring. An exceptionally high price for cottonseed oil could not by itself have more than a small influence on the total quantity produced in the world in the short run, and not a much larger effect on the total quantity produced even in the long run. The production of such an oil as soybean oil is likely to be at least as responsive to the price offered for the oil cake as the price offered for the oil (the oil yield of soybeans is only about 15 percent by weight). The production of tallow (including oleo oil) will depend principally on the slaughter of livestock rather than on the price offered for tallow. The production of lard and inedible grades of hog greases is influenced by similar considerations. Many other examples could be cited showing the correlation between prices and the production of individual oils and the rapidity with which changes in output might be expected to follow changes in price.

Future consumption in the United States.

Future consumption of all fats and oils in the United States, particularly in terms of value, will be governed by a number of factors which cannot be very accurately estimated at present. Except in a few instances, moreover, the estimate of the consumption in the United States of any particular fat or oil will be subject to a greater margin of error than will be the estimate of all the fats and oils that will enter into each of such broad categories of use as food, soap, paint, etc. To illustrate, it is possible to arrive at a first approximation of the total quantity of fats and oils that will enter into food, into soap, into paint, and into miscellaneous products on the basis of various assumptions as to levels of tariff and national income. It is also possible to arrive at somewhat less accurate estimates of the consumption of certain individual fats and oils, such as butter and olive oil used in food, tung oil used in paint, and palm oil used in manufacturing tin plate. But no estimates of the future consumption of the fats and oils used in all foods, in all soaps, or in all paints, would provide the basis for very accurate estimates of the amounts of each fat and oil that would enter into any one, or into all, of these broad categories of use.

In view of the foregoing considerations, this report does not attempt to forecast the production, consumption, etc. of every individual fat or oil in each or in all of its uses. Major emphasis is placed on forecasting the total quantities that will enter into each main category of use. The estimates of the foreign fats and oils that will enter into each main use are arrived at by various methods, each of which will be described. Where estimates of individual fats and oils are given, they are given only in the text, and are expressed in terms of ranges, that is, minimums and maximums.

Circumstances which would operate to bring about a maximum use of almost any oil would operate to bring about a minimum (or near minimum) use of one or more of some others. The maximum consumption of, say, lard in food, palm oil in soap, and tung oil in paint would probably occur when there was a minimum consumption of some one or more of the other oils entering respectively into food, soap, paint, etc. This consideration has been taken into account in estimating the ranges of consumption of individual fats and oils in

relation to the estimated range of consumption of all fats and oils entering into each of the four broad categories of use.

To simplify the tabular presentation of the estimates under the various assumed conditions, the values of production, consumption, etc., are expressed, not as the ranges given in the accompanying text but rather, as single figures taken at the midpoints of those ranges. All estimates shown in the tabulations covering fats and oils used in food, soap, paint, etc., as well as in the over-all tabulations based on these individual tabulations, should be so interpreted.

United States Supply, 1939

Consumption.—As shown in the accompanying table 1 and chart, 66 percent of United States total consumption of fats and oils in 1939 entered into food products, 19 percent into soap, 9 percent into paint, varnish, and linoleum, and 6 percent into miscellaneous products. Less than 20 percent of all the fats and oils consumed were derived from foreign materials—inclusive of coconut oil made from Philippine copra. The fats and oils of foreign derivation accounted for 7 percent of the total used in food, 34 percent of those used in soap, 60 percent of those used in paint (including varnish, linoleum, and printing inks), and 51 percent of those in miscellaneous manufactures.

TABLE 1.—Fats and oils: Apparent consumption in the United States, by major classes, in 1939

[Quantity in millions of pounds]

Product	Quantity					Percent of total				
	Food	Soap	Paint and varnish, linoleum and oil-cloth, and printing inks	Miscellaneous manufactured products	Total, all uses	Food	Soap	Paint and varnish, linoleum and oil-cloth, and printing inks	Miscellaneous manufactured products	Total, all uses
Domestic:										
Butter (as butterfat).....	1,888.8				1,888.8	31.1				20.5
Lard.....	1,632.3				1,632.3	26.9				17.7
Cottonseed oil.....	1,300.5	55.1	0.2	19.0	1,384.5	21.4	3.1	(?)	3.6	15.0
Tallow, inedible, and grease (except wool grease).....		905.3	.6	171.8	1,077.7		51.1	0.1	32.3	11.7
Soybean oil.....	386.3	21.8	28.2	12.3	450.6	6.4	1.2	3.5	2.3	4.9
Linseed oil.....		1.0	250.6	4.5	256.1		.1	31.0	.9	2.8
Fish oils (including fish-liver oils).....	20.3	117.4	42.6	36.8	217.5	.3	6.6	5.3	6.9	2.4
Corn oil.....	128.4	10.1		3.7	143.5	2.1	.6		.7	1.5
Oleo oil and edible animal stearin.....	106.8	.3		.2	107.3	1.8	(?)		(?)	1.2
Tallow, edible.....	92.4	.6			93.0	1.5	(?)			1.0
Peanut oil.....	74.9	2.8		1.0	79.1	1.2	.1		.2	.9
Marine mammal oils.....		51.1	(?)		51.1		2.9	(?)		.6
Olive oil, edible.....	6.9				6.9	.1				.1
All other.....		(?)	.6	10.7	11.3		(?)	.1	2.0	.1
Total, domestic.....	5,637.6	1,165.5	322.8	260.0	7,399.7	92.8	65.7	40.0	48.9	80.4
Foreign:										
Coconut oil.....	169.6	410.8	.7	15.1	600.1	2.8	23.2	.1	2.8	6.5
Linseed oil.....		.9	298.3	6.0	305.2		.1	37.0	1.1	3.3
Palm oil.....	115.7	118.7		54.6	292.0	1.9	6.7		10.3	3.2
Tung oil.....			103.1	2.5	105.6			12.8	.5	1.1
Castor oil.....		1.0	11.8	66.3	79.1		.1	1.5	12.5	.9
Babassu oil.....	22.9	40.2		4.5	67.6	.4	2.3		.8	.7
Fish oils (including fish-liver oils).....				66.8	66.8				12.6	.7
Olive oil, edible.....	58.8	(?)		.1	58.9	.9	(?)		(?)	.6
Perilla oil.....		(?)	51.0	1.2	52.2		(?)	6.3	.2	.6
Olive oil, inedible (including sulfur oil or foots).....		20.5		14.5	35.0		1.1		2.7	.4
Cottonseed oil.....	29.4				29.4	.5				.3
Marine mammal oils.....				20.3	20.3				3.8	.2
Oiticica oil.....			18.9	(?)	18.9			2.3	(?)	.2

Corn oil.....	12.5	1.4	.....	.1	14.0	.2	.1	.....	(?)	.2
Palm-kernel oil.....	6.1	4.5	.....	.8	11.4	.1	.2	.....	.2	.1
All other.....	22.0	9.4	(?)	19.3	50.7	.4	.5	(?)	3.6	.6
Total, foreign.....	437.0	607.4	483.8	272.1	1,807.2	7.2	34.3	60.0	51.1	19.6
Total, domestic and foreign.....	6,074.6	1,772.9	806.6	532.1	9,206.9	100.0	100.0	100.0	100.0	100.0
Allocation of apparent consumption of domestic and foreign fats and oils, 1939										
Domestic fats and oils.....	5,637.6	1,165.5	322.8	260.0	7,399.7	78.2	15.8	4.4	3.5	100.0
Foreign fats and oils.....	437.0	607.4	483.8	272.1	1,807.2	24.2	33.6	26.8	15.1	100.0
Total.....	6,074.6	1,772.9	806.6	532.1	9,206.9	66.0	19.3	8.8	5.8	100.0

¹ The difference between this total and the sum of the amounts allocated to the separate uses represents the refining loss.

² Less than 0.05 percent.

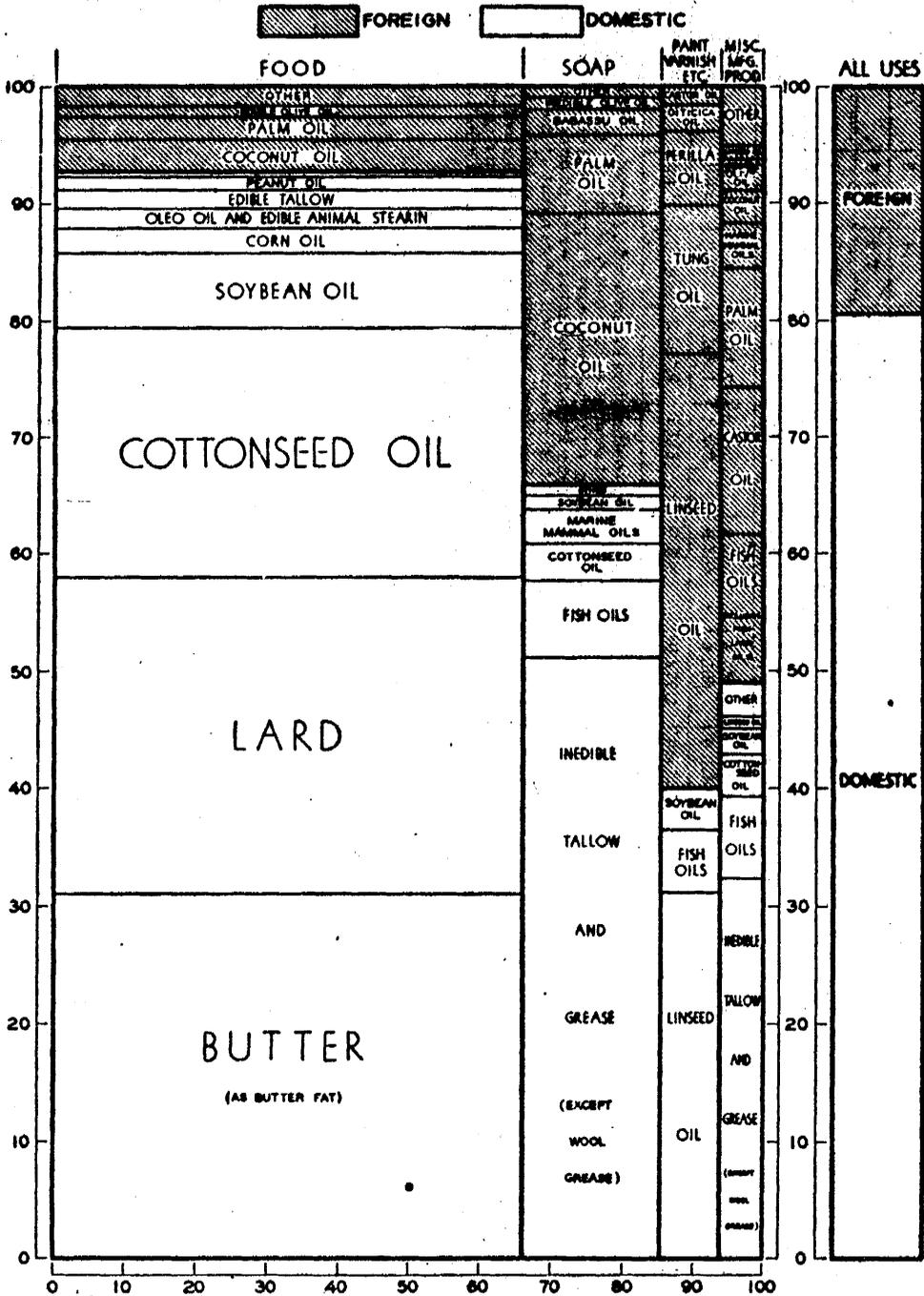
³ Less than one-half million pounds.

Source: Consumption of fats and oils in shortening, margarine, soap, linoleum and oilcloth, and printing inks is factory consumption as reported by the U. S. Bureau of the Census. Consumption of fats and oils in edible products other than shortening and margarine, in paint and varnish, and in miscellaneous products represents the difference between apparent disappearance, as reported by the U. S. Department of Agriculture, and

the total factory consumption in shortening, margarine, linoleum and oilcloth, and printing inks, allocated according to the nature of the oil. Residues known as "foots" (which are used in soaps and for miscellaneous purposes) are obtained as a byproduct in the refining of oils. Some losses also occur in the refining processes. The Bureau of the Census does not report these separately, but it does report a "loss" item which covers both. In the above table, this "loss" has been allocated as follows: 67 percent to soap; 21 percent to miscellaneous manufactured products; and 12 percent to loss. The difference (20.7 million pounds) between the total fats and oils shown as consumed for all purposes and the sum of the fats and oils shown as consumed in the individual categories of use represents this estimated loss.

FATS AND OILS

APPARENT CONSUMPTION IN THE UNITED STATES, BY MAJOR CLASSES OF USE 1939



HORIZONTAL SCALE: PERCENTAGE OF TOTAL CONSUMPTION BY MAJOR CLASSES OF USE.
 TOTAL CONSUMPTION (MILLION POUNDS) 8998.9
 VERTICAL SCALE: PERCENTAGE COMPOSITION WITHIN EACH MAJOR CLASS OF USE.
 CONSUMPTION (MILLION POUNDS): FOOD 6074.6; SOAP 1772.9;
 PAINT AND VARNISH 806.6; MISCELLANEOUS 532.1

SOURCE: BASED ON DATA SUPPLIED BY U. S. DEPARTMENT OF AGRICULTURE AND U. S. BUREAU OF THE CENSUS

U. S. TARIFF COMMISSION
 FEBRUARY 1948 -- (24478)

The per capita consumption of fats and oils entering into each of the main categories of use in 1939, and the proportions supplied by imports in each of these uses, were not greatly different from those in a number of preceding years. Prices of fats and oils in 1939 not only were somewhat lower than in the immediately preceding years, but were slightly more depressed than general prices.

Exports.

United States exports of primary fats and oils in 1939 consisted almost wholly of lard, coconut oil, cottonseed oil, and soybean oil. The aggregate quantity of all fats and oils exported in that year, but more especially lard and soybean oil, was very much greater than in any of the immediately preceding years, as shown in the following table. The explanation of the large exports was that domestic production, particularly that of lard was very high and European buyers were finding it difficult at that time to obtain supplies in the Far East, especially in Manchuria—notable for its exports of soybeans and soybean oil. Also, the imminence of hostilities in Europe operated to encourage some stock-piling there, especially of fats and oils suitable for food.

Table 2 shows United States exports of all fats and oils in the period 1937-39. Some United States exports, notably coconut, linseed,¹ and castor oils, consisted of oils processed from imported materials, and of these, only coconut oil was of a kind generally used for food. Of the exports derived wholly from domestic materials, practically all were of the kinds customarily used for food. It is reasonable to suppose, therefore, that United States exports of fats and oils of wholly domestic origin in the post-war period will consist almost entirely of these same kinds, but predominantly of lard. The United States would not appear to have any competitive advantage over foreign countries in the production of any other fat or oil used for food, such as butter, fish and marine mammal oils, or vegetable oils. It might, however, be able to remain on an export basis in soybeans.

TABLE 2.—Fats and oils: United States exports of domestic merchandise, 1937-39

[In thousands of pounds]

Commodity	1937	1938	1939
Animal fats and oils:			
Butter ¹	800	1,959	2,308
Lard and neutral lard.....	136,778	204,603	277,272
Tallow, edible and inedible.....	1,149	729	2,318
Oleo oil.....	5,711	5,310	5,466
Oleo stearin.....	601	181	153
Oleo stock.....	2,656	2,874	4,894
Grease stearin.....	384	891	544
Neat's-foot oil.....	907	845	615
Other animal oils, inedible.....	771	505	1,174
Other animal greases and fats.....	3,415	1,899	2,285
Total.....	153,172	219,846	297,029
Marine-animal oils.....	1,949	2,677	16,533

¹ In terms of total weight, only about 81 percent of which is butterfat content.

² Includes 14,254 thousand pounds of whale oil.

¹ Inasmuch as linseed oil made from imported flaxseed would be subject to a draw-back on being exported, it may be assumed that virtually all the exports were made from imported rather than domestic materials.

TABLE 2.—Fats and oils: United States exports of domestic merchandise, 1937-39—
Continued

[In thousands of pounds]

Commodity	1937	1938	1939
Vegetable oils:			
Coconut ²	9,023	7,228	26,038
Corn.....	444	113	180
Cottonseed ⁴	7,591	4,872	13,645
Linseed.....	967	890	2,566
Peanut.....	(⁵)	(⁵)	325
Soybean ⁶	6,748	6,412	12,111
Castor oil, medicinal ⁷	834	572	1,348
Other vegetable oils.....	4,832	6,786	13,841
Total.....	29,259	26,873	70,054
Grand total.....	184,350	249,396	⁸ 383,316

² Crude plus refined converted to crude by dividing by 0.94.⁴ Crude plus refined converted to crude by dividing by 0.93.⁵ Not separately reported.⁶ Exports of soybeans were very large in this period. They amounted to 76.2 million pounds in 1937, almost 150 million in 1938, and 628 million in 1939.⁷ Converted from gallons on the basis of 8 pounds per gallon.⁸ This total exceeds the one shown in the table on p. 116, principally because the preceding table does not report imported fats and oils subsequently exported or exports of fats and oils made of imported materials (including Philippine copra).Source: *Foreign Commerce and Navigation of the United States*.

Notwithstanding the foregoing observations, it is possible that in the immediate post-war period the United States may export many varieties of fats and oils with a view to assisting in world rehabilitation. Such exports, however, would be governed principally by considerations other than the levels of tariffs or per capita income in the United States or abroad. The conditions most favorable to large exports in this period would be low tariffs and high national income—the same conditions that would be most favorable to large United States imports of fats and oils.

In the long run, United States exports of fats and oils will depend both on the level of per capita income in the United States and abroad and on the level of the tariff duties, particularly those in the United States. United States exports will tend to be largest under conditions of high income and low tariffs, both here and abroad; they will tend to be smallest under opposite conditions.

Tariff Duties and Excise Taxes

Most imported fats and oils are subject to tariff duties, and many of them are in addition subject to excise taxes. Some duty-free imports are also subject to excise taxes. A number of fats and oils are exempt from both tariff duties and excise taxes.

The excise taxes are of two sorts—those which are levied on the importation but not on the domestic production of materials and those which are levied on the processing of materials, none, or virtually none, of which is produced in continental United States. The import excise taxes are administered by the Customs Bureau and are levied, assessed, collected, and paid in the same manner as duties imposed under the Tariff Act of 1930; they are, with certain exceptions, treated, for the purposes of all provisions of law relating to the customs revenue, as duties. Unlike tariff duties, however, they are not subject to change in accordance with section 336 (the so-called flexible tariff

provision) of the Tariff Act of 1930. Other differences are of only minor importance. Import excise taxes are regarded as identical with tariff duties in negotiating agreements under the Trade Agreements Act.

Processing taxes are administered by the Bureau of Internal Revenue and are collected on the first domestic processing of the taxable materials. The Trade Agreements Act does not give authority for reducing processing-tax rates but it does authorize the binding of such rates against increase.

The effects of changes in tariff and excise-tax rates given in this report are estimated on the basis of the rates which prevailed on July 1, 1939. Inasmuch as some of the rates have been changed since then, mostly as the result of trade-agreement concessions, the rates which were in effect on July 1, 1939, and on January 1, 1945, are both shown in the following table. All rates which have been lowered or bound pursuant to trade agreements are so indicated in the table. Rates shown in the "Total duty and tax" columns which are not followed by the symbol "T. A." are (with the exception of one of the rates on olive oil)² those which are provided for by the Tariff Act of 1930 or by the Internal Revenue Code, or by both. Commodities for which no duty or excise tax is shown are free of duty or tax. For duty-free commodities, "T. A." in the column "Total duty and tax" indicates that these commodities have been bound free of duty in trade agreements.

² Edible olive oil in packages of less than 40 pounds each was dutiable at 9½ cents per pound under the Tariff Act of 1930, but the rate was reduced to 8 cents per pound on July 24, 1931, as a result of a Presidential proclamation under the provisions of section 336 of the tariff act.

TABLE 3.—Fats, oils, and oil-bearing materials: United States tariff duties and excise taxes in effect on July 1, 1939, and on January 1, 1945
 [Cents per pound unless otherwise indicated; "T. A." indicates that the tariff or excise tax status shown is provided for in trade agreements]

Commodity	Status on July 1, 1939			Status on January 1, 1945		
	Duty	Excise tax	Total duty and tax	Duty	Excise tax	Total duty and tax
Animal fats and oils:						
Butter.....	14		14	14		14
Lard.....	3		3	3		3
Oleo oil and oleo stearin.....	1	3	4	1½	1½	2 T. A.
Edible fats, greases, and oils, n. s. p. f.....	20% ad val.		20% ad val.	20% ad val.		20% ad val.
Tallow.....	½		¾	¾		1¾ T. A.
Wool grease:						
Containing over 2 percent free fatty acids.....	½	3	3½ T. A.	½	3	3½ T. A.
Containing 2 percent or less free fatty acids.....	1	3	4 T. A.	1	3	4 T. A.
For medical use.....	2	3	5 T. A.	2	3	5 T. A.
Neat's-foot oil and animal oils known as neat's-foot stock.....	20% ad val.	3	20% ad val. +3	10% ad val.	1½	10% ad val. +1½ T. A.
Inedible fats, greases, and oils, n. s. p. f.....	20% ad val.	3	20% ad val. +3	20% ad val.	3	20% ad val. +3
Marine animal oils:						
Sod oil.....	2¢ per gal.		0.4 T. A.	2¢ per gal.		0.4 T. A.
Herring oil.....	5¢ per gal.	3	3.67	2½¢ per gal.	1½	1.83 T. A.
Menhaden oil.....	5¢ per gal.	3	3.67	5¢ per gal.	3	3.67 T. A.
Cod oil and cod-liver oil.....						
Shark oil and shark-liver oil, including oil produced from sharks known as dogfish, n. s. p. f.....	10% ad val.	1½	10% ad val. +1½ T. A.	10% ad val.	1½	10% ad val. +1½ T. A.
Hallbut-liver oil.....	10% ad val.		10% ad val.	10% ad val.		10% ad val.
Marine animal oils, n. s. p. f.....	20% ad val.	3	20% ad val. +3	20% ad val.	3	20% ad val. +3
Whale (other than sperm) and seal oils.....	6¢ per gal.	3	3.8	6¢ per gal.	3	3.8
Sperm oil:						
Crude.....	2½¢ per gal.		0.33 T. A.	2½¢ per gal.		0.33 T. A.
Refined.....	7¢ per gal.		0.93 T. A.	7¢ per gal.		0.93 T. A.
Fish livers.....						
Vegetable oils and oil-bearing materials:						
Nondrying:						
Coconut oil:						
From, or produced in the U. S. of materials from the Philippines or any other possessions of the U. S.....		3	3		3	3
Other imported as oil.....	2	5	7	2	3	5
Other produced in the U. S. from foreign copra.....		5	5		3	3
Palm oil:						
For tin orterne plate.....						T. A.
Other.....		3	3		3	3 T. A.
Palm-kernel oil:						
Rendered unfit for food.....		3	3 T. A.		3	3 T. A.
Other.....	½	3	3½ T. A.	½	3	3½ T. A.

Babassu oil		T. A.		T. A.
Peanut oil	4	4	4	4
Kapok oil	20% ad val.	4½	20% ad val. +4½	4½
Teaseed oil				
Vegetable tallow				
Castor oil	3	3	3	3
Olive oil:				
Rendered unfit for food				
Edible:				
Bulk (40 lb. or over)	6¾	6¾	6¾	6¾
Packaged (less than 40 lb.)	8	8	8	8
Almond oil, sweet				
Cashew oil and cashew nut shell oil				
Copra		T. A.		T. A.
Palm nuts and palm-nut kernels		T. A.		T. A.
Babassu nuts and kernels		T. A.		T. A.
Ouricury nuts and kernels				
Muru-muru nuts and kernels				
Tucum nuts and kernels				
Peanuts:				
Unshelled	4½	4½	4½	4½
Shelled	7	7	7	7
Kapok seeds		2		2
Castor beans	¾	¾ T. A.	¾	¾ T. A.
Semidrying:				
Corn oil	20% ad val.		20% ad val.	20% ad val.
Cottonseed oil	3	3	3	3
Croton oil				
Rapeseed oil:				
Rendered unfit for food:				
For rubber substitutes or lubricating oils				
Other		4½	4½	4½
Other	6¢ per gal.	4½	6¢ per gal.	4½
Sesame oil:				
Rendered unfit for food		4½	4½	4½
Other	3	3	3	3
Sunflower oil:				
Rendered unfit for food		4½	4½	2¾
Other	20% ad val.	4½	20% ad val. +4½	2¾
Cottonseed	¾	¾	¾	¾
Rapeseed		2		2
Sesame seed		1.18	1.18	1.18
Sunflower seed	2	2	2	2
Apricot and peach kernels	3	3	2¾	2¾ T. A.
Drying:				
Hempseed oil	1½	4½	1½	4½
Linseed oil	4½	4½	4½	4½
Perilla oil		4½		4½
Oiticica oil				T. A.
Poppyseed oil	2	2	2	2
Rubberseed oil	20% ad val.		20% ad val.	20% ad val.
Safflower oil	20% ad val.		20% ad val.	20% ad val.

TABLE 3.—Fats, oils, and oil-bearing materials: United States tariff duties and excise taxes in effect on July 1, 1939, and on January 1, 1945—Continued

[Cents per pound unless otherwise indicated; "T. A." indicates that the tariff or excise tax status shown is provided for in trade agreements]

Commodity	Status on July 1, 1939			Status on January 1, 1945		
	Duty	Excise tax	Total duty and tax	Duty	Excise tax	Total duty and tax
Vegetable oils and oil-bearing materials—Continued.						
Drying—Continued.						
Soybean oil.....	3½ (not under 45% ad val.)		3½ (not under 45% ad val.)	3½ (not under 45% ad val.)		3½ (not under 45% ad val.)
Tung oil.....						
Walnut oil.....						
Hempseed.....		1.24	1.24		1.24	1.24
Flaxseed.....	65¢ per bu. of 56 lbs.		1.16	32½¢ per bu. of 56 lb.		6.58 T. A.
Perilla seed.....		1.38	1.38		1.38	1.38
Poppyseed.....	16¢ per 100 lbs.		0.16 T. A.	16¢ per 100 lb.		0.16 T. A.
Rubberseed.....						
Soybeans.....	2		2	2		2
Tung nuts.....						
Expressed or extracted oils, n. s. p. f.....	20% ad val.		20% ad val.	20% ad val.		20% ad val.
Nut oils, n. s. p. f.....						
Seeds and nuts, n. s. p. f., when oils derived from them are free of duty.....						
Fatty acids:						
Stearic acid:						
Valued not over 8¢ per lb.....	25% ad val.	(1)	25% ad val.+ ¹	25% ad val.	(1)	25% ad val.+ ¹
Valued over 8¢ per lb.....	15% ad val.	(1)	15% ad val.+ ¹ T. A.	15% ad val.	(1)	15% ad val.+ ¹ T. A.
Oleic acid.....	20% ad val.	(1)	20% ad val.+ ¹	20% ad val.	(1)	20% ad val.+ ¹
Linseed oil, fatty acids.....	20% ad val.	4½	20% ad val.+4½	20% ad val.	4½	20% ad val.+4½
Fatty acids, n. s. p. f.....	20% ad val.	(1)	20% ad val.+ ¹	20% ad val.	(1)	20% ad val.+ ¹
Salts derived from fats and oils or fatty acids, not elsewhere specified; fatty alcohol and fatty acids sulfated and salts of fatty acids, n. e. s.....	25% ad val.	(1)	25% ad val.+ ¹	25% ad val.	(1)	25% ad val.+ ¹
Hydrogenated or hardened fats and oils.....	4	(2)	4+ ²	4	(2)	4+ ²
Lard compounds and lard substitutes.....	5	(2)	5+ ²	5	(2)	5+ ²
Oleomargarine and other butter substitutes.....	14	(2)	14+ ²	14	(2)	14+ ²
Fats and oils changed by vulcanizing, oxidizing, chlorinating, nitrating, or other chemical process.....	20% ad val.	(1)	20% ad val.+ ¹	20% ad val.	(1)	20% ad val.+ ¹
Combinations and mixtures of fats and oils, with or without other substances.....	25% ad val.	(2)	25% ad val.+ ²	25% ad val.	(2)	25% ad val.+ ²

¹ Excise tax is at the rate applicable to the oil from which derived.

² Excise tax is at the rates applicable to the fats and oils contained in product.

Source: U. S. Tariff Commission.

POST-WAR SHORT TERM

In the short-term period immediately following the close of hostilities, total consumption of all fats and oils (including oil-bearing materials estimated in terms of their oil content) may be expected to be about 10½ billion pounds, annually, compared with almost 9.2 billion pounds in 1939. The proportion supplied by imports may be expected to range between 10 and 15 percent, compared with 20 percent in 1939. Estimates of the values of the respective shares supplied by domestic production and by imports cannot be satisfactorily made for several reasons: (1) The demand for fats and oils is such that small changes in supply could result in large changes in price; (2) the speed with which world production can be brought back to normal and government controls over prices be abandoned, cannot be readily appraised; and (3) no detailed information is available on the extent to which the United States will, as part of its assistance toward world rehabilitation, provide fats and oils (as well as products made from them) to other countries and the extent to which these supplies will come from domestic sources.

POST-WAR LONG TERM

Consumption, Production, Imports, and Exports

The following two summary tabulations show estimates of production, exports, imports, and consumption of all fats and oils used for all purposes, under various assumptions as to levels of per capita income and tariff duties. These tabulations may, therefore, be compared with the corresponding tabulation showing the supply of all fats and oils in 1939, as indicated on page 196 of this report. The estimates of quantities and values shown in the over-all tabulations below are computed from the estimates given in the following sections of this report dealing separately with the fats and oils used in (1) food, (2) soap, (3) paint, etc., and (4) miscellaneous products.

The estimated effects of changes in tariffs on the quantity and value of production and consumption of fats and oils in the aggregate of their uses are not large. The greater part of the consumption of all fats and oils, both in terms of quantity and more especially in terms of value, is in food. The effects of tariff changes on the production and consumption of the fats and oils used in food would be small, principally for the following reason: The domestic production of butter, lard, cottonseed oil, tallow and oleo oil, corn oil, and peanut oil, a group which has generally accounted for 75 percent or more of the total quantity of fats and oils used in food, is not likely to be altered much quantitatively, or very much even in terms of value, by changes in tariffs. The estimated effects of tariff changes on the quantity and value of fats and oils used for other than food likewise are not large. The estimated over-all effects of tariff changes on imports are marked, whether expressed in terms of absolute or percentage change; but the corresponding effects on exports are large only in terms of percentage change, inasmuch as the quantities involved are relatively small.

Per capita income at 1939 level.

Consumption of fats and oils in their four main uses would reflect not only a 10-percent increase in the population of the country, but also a slightly higher per capita consumption in food, a somewhat higher consumption in soap, and still higher per capita consumptions in paint, etc., and in miscellaneous products. The over-all consumption would be about 15 percent higher than in 1939. Prices of fats and oils are estimated, in the absence of tariff changes, to average about 10 percent higher than in 1939, inasmuch as their prices in that year were not only below their average during the 1920's but were also somewhat more depressed than general prices.

The principal effects that might be expected from tariff reductions would be: (1) An increase in the volume of imports and exports but particularly imports; (2) an increase in the spread in the United States between prices of fats and oils used mainly in food and those used mainly in soap, principally by lowering the prices of domestic fats and oils used in soap; (3) a decrease in the production of vegetable oils made wholly from domestic materials, notably linseed oil and soybean oil, and also the production of fish oil; and (4) a lowering of the duty-paid prices of imported fats and oils, but not by the full amounts of the reductions in duties.

Increases in duties could be expected to have effects opposite to those caused by tariff reductions.

Estimates of United States production, imports, and consumption of all fats and oils, with income as in 1939, under various tariff levels, are shown below:

Tariff treatment	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Duty as in 1939:						<i>Percent</i>
Quantity (million pounds).....	8,765	255	8,510	1,980	10,490	19
Value (million dollars).....	1,033	20	1,073	198		
Duty reduced by 50 percent:						
Quantity (million pounds).....	8,556	321	8,235	2,325	10,560	22
Value (million dollars).....	1,057	25	1,032	118		
Duty increased by 50 percent:						
Quantity (million pounds).....	8,949	179	8,770	1,650	10,420	16
Value (million dollars).....	1,130	14	1,116	180		

† Foreign value.

Per capita income 75 percent higher than in 1939.

Consumption of all fats and oils would probably be about 21 percent higher than in 1939 and 6 percent higher than estimated on the basis of the 1939 level of income. Consumption in food would probably be about 2½ percent higher than estimated on the basis of the 1939 level of income, consumption in soap about 5 percent higher, the consumption in paints about 25 percent higher, and consumption in miscellaneous products about 16 percent higher. Domestic production of byproduct fats and oils, notably lard and cottonseed, would be much higher than estimated under the lower income level, with the consequence that their prices would probably be lower. In such circumstances, imports of fats and oils directly competitive with lard and cottonseed oil would be lower; more lard would be exported; more hog

greases and less fish oil would enter into domestic soap; imports of olive oil, and imports and domestic production of most of the oils used in paint, varnish, and linoleum, and a number used in miscellaneous products would be higher.

Under the higher income level, but with tariffs unchanged, prices are estimated as follows: in the food group, butter about 60 percent higher than in 1939, olive oil 35 to 45 percent higher, lard and tallow 10 percent lower, and most other fats and oils at about their 1939 level; in the soap group, most foreign oils and domestic fish oil the same as in 1939, and most other domestic fats and oils 10 percent lower; in the paint group, fish oil and soybean oil at the 1939 level, and flaxseed and linseed oil (domestic and foreign) 20 to 30 percent higher, tung oil 35 to 45 percent higher, and most other imported oils 20 to 30 percent higher; and in the miscellaneous group, castor oil 20 to 30 percent higher, fish liver oil 30 to 50 percent higher, and other fats and oils as indicated in their other uses.

The general effects of altering tariffs would be much the same as estimated under the lower level of income, except that the effects on the prices of the principal domestic fats and oils used in food and in soap would be somewhat less pronounced.

Estimates of United States post-war production, imports, and consumption of all fat and oils, with income 75 percent higher than in 1939, under various tariff levels, are shown below:

Tariff treatment	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Duty as in 1939:						<i>Percent</i>
Quantity (million pounds).....	9,627	347	9,280	1,840	11,120	17
Value (million dollars).....	1,482	24	1,458	125		
Duty reduced by 50 percent:						
Quantity (million pounds).....	9,434	429	9,005	2,200	11,205	19
Value (million dollars).....	1,463	29	1,434	147		
Duty increased by 50 percent:						
Quantity (million pounds).....	9,805	280	9,525	1,510	11,035	14
Value (million dollars).....	1,503	20	1,483	106		

¹ Foreign value.

Employment

No estimates of the over-all employment of persons engaged in the production of fats and oils in the United States can be made as virtually all such materials are produced jointly with other products. Some statistics of employment in the crushing industry are available; these are reported in the section dealing with paint, etc.

Part II. Fats and Oils Used in Foods

Tariff paragraph: 52, 53, 54, 701, 703, 709, 1727, 1732.

Commodity: Fats and oils used in foods.

Rates of duty: Free to 14¢ per lb.

Equivalent ad valorem (1939): 0% to 136% (weighted average, including duty-free imports, 77%).

NOTE.—For statement of tariff history see p. 196.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	5,953	315	5,638	437	6,075	Percent 7
Value (million dollars).....	1,853	23	830	139		

¹ Estimated.

² Foreign value.

The fats and oils which enter into food in the United States are consumed principally in the form of butter,¹ margarine, shortening, cooking fats, salad oils and dressings, including mayonnaise and sandwich spreads. The aggregate per capita use of fats and oils in food has not changed materially in recent years; in 1931 it amounted to 44.1 pounds, and in 1939 to 46.6 pounds, an increase of only about 5 percent. The per capita consumption of many individual fats and oils, however, has shown a greater change.

It appears that the consumption of fats and oils in food in the United States is much more closely related to the size of the population than to any other factor. With a sharp rise in national income, however, people might consume more of the higher priced fats such as butter and possibly less of the lower priced fats such as those used in margarine and shortening, and they would probably waste more fats and oils by discarding left-overs, bacon grease, and drippings. They would no doubt also eat out more frequently, a practice which would operate to increase apparent consumption. Changes in the prices of individual fats and oils, such as might be expected from alterations in the tariff and changes in the level of national income, could not be expected to influence greatly the total quantity of fats and oils consumed per person; but they could be expected to have a considerable effect on the quantity and price of some of the individual kinds used.

The United States has generally been on an export basis for fats and oils used in food (notably lard), but it has always imported some kinds. Imports have consisted of two broad classes: Oils for which there is a special demand in certain uses and of which there is either only a negligible domestic production (such as olive oil) or none at all (such as the lauric-acid oils—coconut, palm-kernel, and babassu); and fats and oils which are used principally because of the favorable price at which they are available. The latter group consists of some fats and oils identical with those produced domestically, such as cottonseed, soybean, and peanut oils, and of others which, though not of identical derivation, have more or less identical uses, such as palm oil, and the lauric-acid oils in most of their uses. In 1939 approximately 93 percent of the fats and oils used in food in the United States came from domestic sources.

¹ Throughout this report, unless otherwise noted, all data on butter are given in terms of its butterfat content. Butter ordinarily contains 81 percent of butterfat.

In terms of quantity, but more especially value, butter was the most important single fat used in 1939, and almost all of it was of domestic origin. The increasing acceptance of margarine since 1929 may possibly operate to lessen the demand for butter in the post-war period. (Consumption of butter declined during World War I but shortly thereafter rose to the level which existed before that war.) After the present war domestic production of butter will no doubt continue to supply nearly all domestic consumption under any of the sets of conditions premised in this report. The value of the production may be expected to be considerably affected by changes in the level of income, but probably not by changes in tariffs.

Lard, next in importance to butter in terms of quantity consumed in 1939, is generally used only in food, but it may also be used in soap and in fact it has been. Production of lard varies widely, but inasmuch as it is essentially a byproduct its output is not very responsible to changes in prices. The smaller the spread in price between edible and inedible fats, however, the more of the potential lard output is diverted to the production of greases used in soap and in certain miscellaneous products. The output of hog fats depends principally on the production of hog meat products. Under any of the sets of conditions assumed in this report all of such fats consumed in the United States will continue to be of domestic origin. But the levels of national income and tariffs, not only in the United States but to some extent those in foreign countries, will largely determine how much of the production will go into domestic food, how much will be exported and how much, if any, will go into domestic soap and miscellaneous products. High per capita income in the United States would operate to increase the production, exports, and domestic consumption in soap and in miscellaneous products; but it would operate to decrease the consumption in food principally because of the greatly increased domestic production of cottonseed oil that might be expected under conditions of high national income. High per capita income abroad would also operate to increase United States exports of lard but would tend to diminish the domestic consumption of hog fats, particularly in soap and miscellaneous products. Increased United States tariffs on fats and oils would operate to reduce exports of lard and to increase the domestic consumption in all categories of use; and increased foreign tariffs, especially on lard, would operate in the same direction. Changes in the price of lard resulting from alterations in tariffs, either by the United States or by foreign countries, would probably be small under any of the circumstances premised in this report, particularly under the high income level. Increases in United States tariffs would operate to curtail United States imports of vegetable oils used principally in making soap in this country and would, therefore, tend to depress their prices slightly in foreign countries where United States exports of lard find their market. Sales of lard would then have to meet increased competition abroad from the lower priced vegetable oils, in which circumstances the United States exports of lard could be expected to decline. Lard generally commands a price premium over vegetable oils in most foreign countries, but it is generally sold below the prices of competitive grades of edible vegetable oils in the United States.

Cottonseed oil is also a byproduct the output of which will be governed almost wholly by the size of the cotton crop. Under any of

the assumed conditions as to tariffs and national income, virtually all of the domestic production except the foots (inedible residue) may be expected to enter solely into foods in the United States. The volume of imports of cottonseed oil under the low level of income might be influenced slightly by the level of tariffs; under high national income, there would probably be no imports. Prices of domestic cottonseed oil would probably be affected only slightly by changes in tariffs.

Production of soybean products in the United States has expanded during a period in which technological improvements have been made in treating domestic vegetable oils, principally cottonseed and soybean, so that they can replace imported palm oil in all of its food uses and can replace the lauric-acid oils in virtually all of their food uses. Under any of the assumed income and tariff levels, soybean oil will probably supply a much larger fraction of the total quantity of all fats and oils entering into food in the United States than it did in 1939. The production of soybeans, however, will depend quite as much on the demand for soybean cake as for the oil. The quantity of soybean oil that will enter into food (as well as into each of its other uses) is, therefore, extremely difficult to predict with any degree of accuracy. Both the level of national income and the height of the tariffs will be important factors. Production in the future, however, may vary inversely with the level of national income, because the higher the national income, the greater the probable production of competitive byproduct fats and oils, notably lard and cottonseed oil. Except in the short-run period, exports of soybean oil cannot be expected to be large, but the United States may possibly remain on an export basis for soybeans.

Corn oil is a byproduct of which the domestic output will vary principally with the production of cornstarch (which is used either as such or for conversion into corn sirup and corn sugar). All the corn oil (except foots) may be expected to enter solely into foods in the United States; imports of corn oil are not likely to be important, and exports are likely to be negligible.

Edible tallow and oleo oil are byproducts of the production of meat other than hog meat. Variations in their output would therefore be only moderately affected by changes in national income and in tariffs. At present only about 15 percent of the tallow and animal greases goes into foods; the remainder goes chiefly into soap. Even under exceptionally favorable conditions, only a slightly larger share would probably go into food.

The following estimates of consumption of fats and oils in food in the United States under various assumptions in regard to per capita income and levels of tariff are based on the considerations discussed above. Under each set of assumed conditions total consumption in the United States of all fats and oils entering all foods is based on estimated per capita consumption. Consumption of butter and of olive oil are each separately estimated; then the consumption of cottonseed oil, corn oil, and edible tallow (including oleo oil) are each arrived at separately on the basis of respective estimates of cotton crops, cornstarch production, and slaughter of livestock other than hogs. The aggregate consumption of all fats and oils in food, less the consumption that will be supplied by the total of the individual

fats and oils mentioned (butter, olive oil, cottonseed oil, corn oil, and tallow) represents the "residual" portion of consumption.

This residual will be supplied principally by domestic lard, soybean oil, and peanut oil and by a wide variety of imported fats and oils (other than butter and olive oil), such as coconut, palm-kernel, palm, and babassu oils. Under any of the premised conditions, most of this residual will be supplied by domestic fats and oils. In the short run, probably all but a very small part will be, because in the immediate post-war period United States production of fats and oils that can be used for food will no doubt far exceed the domestic consumption in such uses. Some of these fats and oils, therefore, will either be exported or will go into inedible products in the United States, or both. In the long run the level of national income and the height of the tariff will largely determine how large a share of the residual will be supplied by imports. The higher the national income, the smaller the share, and the lower the national income, the larger the share. The lower the tariffs the greater the share; and the higher the tariffs, the smaller the share. Moreover, the higher the income and the lower the tariffs, the larger will be United States exports of lard; and the lower the income and the higher the tariffs, the smaller such exports will be. The principal imports under any circumstances, however, will consist of olive oil, the lauric-acid oils, and palm oil.

In 1939, imports of olive oil supplied virtually all the domestic consumption, and they are likely to continue to do so in the future under any of the income and tariff conditions considered in this report. The quantity and the foreign value of the imports, however, are likely to be moderately responsive to changes in the levels of both incomes and tariffs.

The lauric-acid oils (coconut, palm-kernel, and babassu) have two distinct classes of use in foods in the United States. One is a specialty use, such as in the production of certain bakery and confectionery products, for which no domestic oil is considered as satisfactory. The other class of use—and a much more important one—is one in which the non-lauric-acid oils are just as suitable from a technological standpoint. Minimum use of lauric-acid oils would therefore be governed by the quantity needed to meet the specialty uses. Consumption of lauric-acid oils beyond this point would be governed by much the same considerations as would determine the consumption of palm oil and other imported non-lauric-acid oils used in food.

Palm oil and most of the other imported vegetable oils not separately discussed above were imported to meet essentially the same needs as the domestic vegetable oils. In view of the greatly increased production of soybeans in the United States since 1939, it is doubtful that the imports of palm oil and these other oils, considered as a group, will again be as important for use in food as they were in that year, except possibly under conditions of an unchanged per capita income and reduced duties.

The principal exports in recent years of wholly domestic derivation have been lard, cottonseed oil, and soybean oil. In 1939 the exports of lard amounted to 277 million pounds out of a total export of 297 million pounds of all animal fats and oils used for all purposes but chiefly for food. Exports of cottonseed oil amounted to 14 million pounds, and those of soybean oil amounted to 12 million pounds.²

² Exports of soybeans amounted to 628 million pounds.

There were also exports of 26 million pounds of coconut oil in 1939, all of which were derived from imported materials. Exports of butter, oleomargarine, and prepared cooking fats were negligible in the pre-war period.

POST-WAR SHORT TERM

Total consumption of all fats and oils in food in the United States in 1939 was 6.1 billion pounds, or 46.6 pounds per capita. The per capita consumption was about 2½ pounds less than this in 1943. Per capita consumption in the immediate post-war period may be expected to be slightly above the 1939 level. Consumption of imported oils will probably be comparatively small, irrespective of the levels of tariffs and national income and will probably consist principally of olive oil, palm oil, and the lauric-acid oils (coconut, palm-kernel, and babassu).

The total consumption of all fats and oils entering into food in the immediate post-war period may be expected to be 6½–7 billion pounds, of which imports may be expected to supply 1–3 percent of the total, compared with 7 percent of the total in 1939. The volume of exports will probably be governed less by the levels of United States tariffs and national income than by the nature and extent of United States efforts toward world rehabilitation. No satisfactory quantitative estimates of exports in the immediate post-war period can be made. They will no doubt be substantial and will greatly exceed imports. A large volume of exports could be accompanied by a large volume of imports, a large volume of domestic production, or by both.

POST-WAR LONG TERM

Consumption, Production, Imports, and Exports

Per capita income at 1939 level.

At this income level, the per capita consumption of all fats and oils in foods could be expected to be slightly above the 1939 level. The total consumption would, therefore, be about 6.8–6.9 billion pounds, compared with 6.1 billions in 1939. The share of the total supplied by imports would be affected somewhat, both in terms of quantity and value, by changes in the tariff; changes in the volume of imports resulting from tariff changes would probably be accompanied by corresponding but somewhat smaller changes in the volume of exports. The volume and value of the import trade in certain individual fats and oils, however, would no doubt be considerably affected by changes in tariffs. United States exports in the long run will be governed in large measure by the level of tariffs elsewhere in the world but more particularly by the level of United States tariffs. The conditions most favorable to large exports, both in quantity and value, would be low tariffs and high national income, and conditions least favorable would be high tariffs and low national income. Consumption of butter, cottonseed oil, and corn oil would probably be affected only slightly by changes in tariffs; consumption of lard, tallow, and soybean oil would be affected somewhat more by such changes; and consumption of the principal imported oils (olive oil, palm oil, and the lauric-acid oils) would be considerably affected by changes in tariffs. Consumption of butter might be expected to be 1.8–1.9 billion pounds

(in terms of butterfat content); lard, somewhat over 2 billion; cottonseed oil about 1 billion; soybean oil, 1.0–1.2 billion; the lauric-acid oils, 100–300 million; palm oil, 75–150 million; and olive oil 40–80 million.

The unit values of fats and oils might be expected, in the absence of tariff changes, to be about 10 percent higher than they were in 1939, because in that year the prices of fats and oils were somewhat depressed. Changes in tariffs might be expected to affect principally the prices of vegetable oils—olive oil the most, and cottonseed oil and the lauric-acid oils and palm oil (in terms of foreign value) the least.

Estimates of United States post-war production, imports, and consumption of fats and oils used in food, with income as in 1939, under various tariff levels, are shown below:

Tariff treatment	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Duty as in 1939:						<i>Percent</i>
Quantity (million pounds).....	6, 715	225	6, 490	360	6, 850	5
Value (million dollars).....	970	18	952	18		
Duty reduced by 50 percent:						
Quantity (million pounds).....	6, 675	285	6, 390	485	6, 875	7
Value (million dollars).....	960	23	937	24		
Duty increased by 50 percent:						
Quantity (million pounds).....	6, 725	155	6, 570	255	6, 825	4
Value (million dollars).....	978	12	966	12		

¹ Foreign value.

Per capita income 75 percent higher than in 1939.

An increase in per capita income of this size could be expected to result in about a 5-percent higher per capita consumption of fats and oils than in 1939 or a total consumption in the neighborhood of 6.9–7.1 billion pounds. This would be about 2½ percent larger than the consumption estimated on the basis of the 1939 level of income or about 15 percent more than was actually consumed in 1939. The greater consumption would be accounted for principally by an enlarged use of bakery products, but some part of it would be accounted for by increased wastage. The more expensive fats and oils such as butter and olive oil would probably be in much greater demand, but this might be expected to result more in an increase in their price than in their per capita consumption.

Under conditions of a 75-percent increase in per capita income, consumption of oils and fats would probably be slightly less responsive to tariff changes than estimates on the basis of the 1939 level of income. Consumption of butter might be 2.0–2.1 billion pounds; lard, about 2 billion pounds; cottonseed oil, 1.2–1.3 billion pounds; soybean oil, 0.9–1.1 billion pounds; the lauric-acid oils, 20–150 million pounds; palm oil, 5–75 million pounds; and olive oil, 50–100 million pounds.

The unit prices of most fats and oils, in the absence of tariff changes, might be expected to be about the same as in 1939, but prices of lard and tallow might be about 10 percent lower, butter about 60 percent higher, and olive oil about 35 to 45 percent higher than in 1939.

Changes in tariffs would affect principally the prices of vegetable oils—olive oil the most, and cottonseed oil the least.

Estimates of post-war United States production, imports, and consumption of fats and oils used in foods, with income 75 percent higher than in 1939, under various tariff levels, are shown below:

Tariff treatment	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Duty as in 1939:						<i>Percent</i>
Quantity (million pounds).....	7,150	305	6,845	190	7,025	3
Value (million dollars).....	1,841	20	1,821	115		
Duty reduced by 50 percent:						
Quantity (million pounds).....	7,140	380	6,760	290	7,050	4
Value (million dollars).....	1,342	25	1,317	121		
Duty increased by 50 percent:						
Quantity (million pounds).....	7,100	245	6,855	85	7,000	1
Value (million dollars).....	1,343	17	1,325	111		

† Foreign value.

Part III. Fats and Oils Used in Soap

Tariff paragraphs: 52, 53, 54, 701, 1727, 1732, 1794.

Commodity: Fats and oils used in soap.

Rate of duty: Free to 5¢ per pound.

Equivalent ad valorem (1939): 0% to 136% (weighted average equivalent ad valorem (including duty-free imports), 99%).

Note—For statement of tariff history see p. 196.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	1,178	12	1,166	607	1,773	<i>Percent</i>
Value (million dollars).....	54	1	53	117		24

† Estimated foreign value.

A wide variety of fats and oils enter into the production of the many different kinds of soaps made in the United States; and the oil constituents of these soaps vary somewhat with the forms in which the soaps are marketed but more especially with their intended use. Soaps are produced as bars, chips, flakes, granules, powder, liquids, and paste; and they are intended for general toilet purposes, for use in household and commercial laundries, factories, and offices, and in a number of industrial processes such as in the manufacture of synthetic rubber and wire drawing. Changes in tariffs and in national income are not likely to have uniform effects on the demands for soaps used for each of the above purposes. And since the constitu-

ents of the different soaps vary, the demand for the different fats and oils used in them cannot be expected to change uniformly.

Most soaps intended for general toilet and household laundry purposes are made of animal tallow and greases, palm oil, or fish oil in combination with one or more of the so-called lauric-acid oils, the most common of which are coconut, palm-kernel, and babassu. These lauric-acid oils impart free-lathering and quick-sudsing properties to soaps and are therefore much in demand for making the kinds used in the household for most toilet and laundry purposes. The ratio of lauric acid to non-lauric-acid oils used in such soaps can be altered within considerable limits; but if the ratio is too high, the soaps may cause skin irritation, and if too low, they will not produce the desired lathering and sudsing properties. Lauric-acid oils usually account for 20 to 30 percent of the total oil ingredient in toilet soaps (bar, flake, granular, and chip) and for 40 to 60 percent of the total used in white bar laundry soaps. No lauric-acid oils are produced, or are likely to be produced, in the United States; and no domestic materials have been found which could replace lauric-acid oils in ordinary soaps.

Soaps used by commercial laundries (other than the small, so-called hand laundries) contain little or no lauric-acid oils and, therefore, need not necessarily contain any foreign oil. Soaps used in cleaning offices and factories vary from the kinds used in the household to special types containing large admixtures of chemical detergents. Soaps used in manufacturing synthetic rubber and for wire drawing may or may not contain lauric-acid oils, but they do not require any.

Irrespective of changes in national income and in levels of tariffs, the increasing emphasis on cleanliness, both in homes and factories, will operate to bring about a greater consumption of soap in virtually all of its principal uses. An accompanying increase in the level of national income would no doubt bring about a still greater increase.

With a high level of national income, more home laundering would presumably be done with washing machines, in which process soap flakes, chips, and powders are generally used. Such laundering generally takes much more soap than does hand-tub laundering, in which the use of bar soap is common. But with an increase in national income, presumably more laundering would also be done by commercial laundries. They not only use soap much more economically than the housewife, but they use different kinds of soap, mostly of the varieties which contain no lauric-acid oils. The ratio of the amount of laundering done in commercial laundries to the amount done in the home, however, will no doubt remain small even with a large increase in national income.

With an increased national income, more soap would also be used in cleaning offices and factories, and very much more would be used in industrial processes such as in making synthetic rubber and in drawing wire. Very little of such soap, however, would necessarily contain any imported fats or oils.

Changes in tariffs and excise taxes (not exceeding 50 percent) on the fats and oils used in soap might be expected to result in not more than a 5-percent change in the price of soap. Such a change would probably have only a small effect on the total quantity of soap consumed in any of its most important uses; the effects would probably

be greatest in household consumption and least in industrial consumption.

At present 85 to 90 percent of all soaps used in the United States are of the household class. And, since under any combination of tariffs and national income premised in this report this class will account for the bulk of the soap consumed, the United States must remain on a substantial import basis for lauric-acid oils. It will no doubt also continue to import some inedible olive oil and palm oil for making special textile soaps and certain highly advertised brands of toilet soap containing such oils. How large the total importation of non-lauric-acid fats and oils will be, however, will depend both on the level of the tariff and the height of the national income. The quantity imported would probably vary inversely with the level of national income. The reason is that the higher the national income, the greater the production of byproduct fats and oils, notably those obtained from cotton and from hog slaughter; and, while there would be an accompanying increase in the consumption of these fats and oils in food, that increase would presumably not be as large as the increase in production. Consequently, some of the potential output of lard would be diverted to the production of greases for use in soap, thus curtailing imports of fats and oils used in soap, particularly the non-lauric-acid fats and oils.

The consumption of all fats and oils used in soap in the United States in 1939 totaled 1.8 billion pounds, of which domestic fats and oils supplied 1.2 billion pounds. Of the 0.6 billion supplied by imports, 0.45 billion consisted of lauric-acid oils—the class of which there is no domestic production. The principal domestic fats and oils used were tallows and greases, fish and marine-mammal oils, and a number of vegetable oils. Almost all of the vegetable oils consisted of foots and off grades. Only a small part of the domestic fats and oils used in soap would have been suitable for food.

The principal imported fats and oils consisted of the various lauric-acid oils (coconut, palm-kernel, and babassu) and palm oil. Most of such oils (except the foots) could, after undergoing suitable treatment, be used for food. The other imported fats and oils consisted principally of olive oil not suitable for use in food.

Estimates of the future consumption of fats and oils that would be used in soaps in the United States under various assumed levels of tariffs and national income are based on the estimated total consumption of all soaps, classified according to whether they are of the types in which lauric-acid oils are used. Next, separate estimates are made of the amounts of domestic tallows and greases, and certain vegetable-oil foots that will be produced as byproducts in the United States. The production of domestic tallows and greases used in soap varies almost directly with the slaughter of meat animals and not with the price of tallow. About 70 percent of the animal tallows and greases now go into soap. The output of foots from cottonseed, soybean, corn, and peanut oils also is largely unrelated to the price received for these foots but separate estimates can be made only for the output of foots from cottonseed and corn oils.

Among the foreign oils used in soap, satisfactory estimates can be made only for the group of lauric-acid oils and for olive oil. In the past, coconut oil has always been the most important among the lauric-acid oils used, but once the Philippines become independent—which is to occur not later than July 4, 1946, on the basis of existing law—

this circumstance may change.¹ If, after that date, the United States excise taxes should discriminate against coconut oil in comparison with all other lauric-acid oils, the whole of the domestic consumption of such oils could be supplied by palm-kernel and babassu oils. These oils are fully interchangeable with coconut oil in the manufacture of soap.

The olive oil used in soap is of the grade which is exempt from duty. The consumption of the oil, moreover, is closely identified with the sale of certain highly advertised toilet soaps and certain types of textile soaps used in limited quantity. Imports are therefore not likely to be influenced much by changes in the general level of duties.

The total consumption of all fats and oils used in soap, less the aggregate supplied by those fats and oils for which separate estimates can be made (as indicated above) represents a residual which could be supplied from either domestic or foreign sources, or from both. The respective shares from each would depend on the level of national income and on the level of tariffs. The domestic varieties in this residual would consist of fish and marine-mammal oils; animal fats and vegetable oils of the grades generally used for food; and the accompanying production of soybean and peanut oil foots. The domestic production of fish and marine-mammal oils would be fairly responsive to changes in tariffs. The total output of the animal fats would not be, but under high tariffs, less of them, especially hog fat, would be manufactured into articles for export such as lard, and more of them used in the domestic manufacture of soap in place of, say, imported palm oil. The foreign fats and oils which might enter into this residual share would consist principally of palm oil, fish and marine-mammal oils, and a variety of vegetable oils and oil foots. The conditions most favorable to maximum imports would be low national income and low tariffs, and to minimum imports, high national income and high tariffs.

Under conditions of maximum imports, the quantity imported would be represented by the difference between (a) the total quantity of fats and oils necessary to make the estimated consumption of soap and (b) the aggregate quantity of domestic fats and oils that will be supplied by tallow and greases and inedible grades of vegetable oils, including foots. The imports would consist of lauric-acid oils, fish and marine-mammal oils, palm oil, olive oil, and a variety of other vegetable oils and oil foots.

Under conditions of minimum imports, the quantity imported would consist of (a) the lauric-acid oils necessary to meet the minimum lauric-acid required for the total soap production plus (b) the amounts of olive and palm oils necessary to make certain highly advertised toilet soaps and some special textile soaps containing these oils.

United States exports of fats and oils intended for use in soap have always been negligible and no doubt will remain so under any of the conditions premised in this report. In the immediate post-war period, the United States might export some such fats and oils as part

¹ The excise tax on coconut oil, irrespective of its derivation, is now 3 cents per pound. Before September 17, 1942, an additional tax of 2 cents per pound was levied on coconut oil that was derived from copras other than those produced in the Philippines or in other United States possessions. This additional tax was suspended on that date, but it is to be resumed 30 days after the President of the United States, following a request of the Philippine Government, proclaims that adequate supplies of copra and coconut oil from the Philippines are again available. Presumably this situation will arise before the islands become independent. Under existing legislation, coconut oil made from foreign copra will then be subject to a 5-cent excise tax, whereas palm-kernel oil will be taxed at 3 cents and babassu oil will be exempt from both excise taxes and tariff duties. The wording of Sec. 802½ of the Internal Revenue Act of 1934, however, leaves some doubt as to whether coconut oil made from Philippine copra will be subject to a total processing tax of 5 cents or of 3 cents, after the Philippine Islands become independent.

of its effort to assist in world rehabilitation, but it is much more probable that it would export finished soap instead.

The following quantitative estimates of the production, exports, etc., of fats and oils used in soap in the United States under various assumed conditions are based on the considerations described.

POST-WAR SHORT TERM

Consumption of all fats and oils used in soap in the United States in 1939 totaled almost 1.8 billion pounds, or approximately 13½ pounds per capita. Taking into account the increasing emphasis on the use of soap, both in the home and in factories, the per capita consumption in the immediate post-war period may rise to about 14½ pounds per capita. Total production of soap, taking into account the anticipated increase in population over 1939, would then require a total of a little more than 2.1 billion pounds of fats and oils. The share that will be supplied by imports in the short term will be determined principally by factors other than the level of tariffs and national income.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The total quantity consumed would be little influenced by changes in tariffs, but the total value of the fats and oils used and the proportion supplied by imports would be. On the basis of an estimated per capita consumption of 28 to 29 pounds of soap, the total quantity of fats and oils consumed would total 2.0–2.1 billion pounds. Of the oils consumed, the lauric-acid oils in the aggregate would probably account for 410–570 million pounds, and palm oil for 200–300 million pounds. In the absence of tariff changes prices could be expected to average approximately 10 percent higher than in 1939. Changes in tariffs would affect principally the prices of babassu oil and most domestic fats and oils used in soap, but they would also affect to some extent the foreign prices of coconut, palm kernel, and palm oils.

Estimates of United States production, imports, and consumption of fats and oils used in soap, with income as in 1939, under various tariff levels, are shown below:

Tariff treatment	Production			Imports	Appar-ent con-sumption	Ratio of imports to con-sumption
	Total	For export	For domestic market			
Duty as in 1939:						<i>Percent</i>
Quantity (million pounds).....	1,277	12	1,265	785	2,050	38
Value (million dollars).....	64	1	63	24		
Duty reduced by 50 percent:						
Quantity (million pounds).....	1,205	15	1,190	880	2,070	43
Value (million dollars).....	51	1	50	28		
Duty increased by 50 percent:						
Quantity (million pounds).....	1,359	9	1,350	680	2,030	33
Value (million dollars).....	79	1	78	20		

¹ Foreign value.

Per capita income 75 percent higher than in 1939.

Under this income level the consumption of soap might be about 5 percent higher than that estimated on the basis of the 1939 level of per capita income and about 20 percent higher than the quantity

actually consumed in 1939. The quantity of fats and oils necessary to make this amount of soap would be 2.1-2.2 billion pounds, of which the lauric-acid oils would probably account for 300-450 million pounds and palm oil for 150-250 million pounds. Changes in the rates of duty would probably affect total consumption of fats and oils only slightly but would have more significant effects on their total value and on the proportion supplied by imports. In the absence of tariff changes, prices of most domestic oils used in soap except that of fish oil would probably be about 10 percent lower than in 1939; and fish oil and most imported oils might be about the same price as in 1939. Changes in duty would affect principally the prices of babassu oil and to much less extent the foreign prices of the other lauric-acid oils and the prices of the principal domestic fats and oils used in soap.

Estimates of United States production, imports, and consumption of fats and oils used in soap, with income 75 percent higher than in 1939, under various tariff levels, are shown below:

Tariff treatment	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Duty as in 1939:						Percent
Quantity (million pounds).....	1,562	17	1,545	605	2,150	28
Value (million dollars).....	68	1	67	17		
Duty reduced by 50 percent:						
Quantity (million pounds).....	1,485	20	1,465	705	2,170	32
Value (million dollars).....	61	1	60	21		
Duty increased by 50 percent:						
Quantity (million pounds).....	1,634	14	1,620	510	2,130	24
Value (million dollars).....	76	1	75	14		

1 Foreign value.

Part IV. Fats and Oils Used in Paint and Varnish, Oilcloth and Linoleum, and Printing Inks

Tariff paragraph: 52, 53, 54, 762, 1727, and 1732.

Commodity: Fats and oils used in paint and varnish, oilcloth and linoleum, and printing inks.

Rate of duty: Free to 4½¢ per pound. *Equivalent ad valorem (1939):* 0% to 110% (weighted average equivalent ad valorem—including duty-free imports—27%).

NOTE.—For statement of tariff history see p. 196.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	326	3	323	494	807	Percent
Value (million dollars).....	25	(1)	25	37		60

1 Less than 0.5 million.

2 Estimated foreign value.

The principal oils used in the so-called drying-oil industries, that is, those which produce paint, varnish, linoleum (including felt-base floor coverings and oilcloth), and printing inks, are linseed, tung, perilla, oiticica, and castor. Soybean and fish oils are also used, but they are not considered wholly satisfactory from a technical standpoint because of their relatively poor drying properties. Linseed oil accounted for two-thirds of the total quantity used in these industries in 1939 and for about 90 percent in 1943.

In the decade 1930-39, about 40 percent of the flaxseed from which linseed oil was derived came from domestic sources and about 60 percent was imported, mostly from Argentina. (Except for the drought years during this period, about half came from domestic sources.) Tung oil, which constituted 13 percent of the total in 1939, accounted for only 1 percent in 1943. Small quantities of tung oil came from domestic sources, but almost all of the rest came from China. Perilla oil, which comes from Manchuria and Japan, constituted 6 percent of the total in 1939, but the oil almost disappeared from use by 1943. Oiticica oil from Brazil, castor oil from castor beans obtained from Brazil, and soybean and fish oils, principally from domestic sources, made up virtually all of the rest. Total consumption of oils in paint, and so on, in 1939 was about 800 million pounds, valued at about 60 million dollars, almost 60 percent of which, both in quantity and value, was of foreign derivation.

Almost all of the linseed, tung, perilla, and oiticica oils consumed in the United States are used in the drying-oil industries. Large quantities of castor oil, mostly specially processed (dehydrated), are also used in these industries. Somewhat over one-half of the castor oil and the bulk of the soybean and fish oils, however, are used for other purposes: Castor oil is used in making textiles, artificial leather, hydraulic brake fluids, emulsion breakers, medicinals, etc.; soybean oil, chiefly in food; and fish oils, chiefly in soap.

A considerable degree of interchangeability exists among the so-called drying oils, but some of them are much preferred to others for specific purposes. Linseed oil paints are predominantly used on outside surfaces. Tung oil is noted for its quick-drying properties and is especially preferred in making rapid-drying varnishes, or varnishes which may be exposed to moisture, alkalis, and acids. It is generally considerably higher priced than linseed oil. Oiticica oil is somewhat similar to tung oil, but tung oil is generally preferred. Perilla oil is more directly competitive with linseed oil but has somewhat better drying properties. Dehydrated castor oil has generally been found a fairly satisfactory substitute for tung oil. Soybean and fish oils are generally blended with oils of higher drying properties, but they can be treated (fractionated or otherwise separated into components) to produce better drying oils. Such treatment, however, involves added costs.

Linseed oil has constituted the bulk of the oils used in the drying-oil industries in the past, and it is likely to do so for some time in the future. It is derived from an annual crop which may be readily expanded or contracted. Tung oil is a tree crop which can be increased only slowly; production from domestic sources consequently could supply only a small part of the requirements for many years. Supplies from China, the world's chief source, are subject to considerable fluctuation, depending on political and economic conditions in

that country. Supplies of perilla oil will depend on the political and economic situation in Manchuria; they may therefore not be very large in the immediate post-war period. Oiticica oil is obtained from the fruit of wild trees in Brazil, and there are limitations on future supplies. Production of castor beans but more especially soybeans can be expanded or contracted rapidly. Fish oils are produced in large quantities, but they are also subject to limitations. Production of soybean and fish oils will probably continue to be influenced principally by factors other than the demand for them as drying oils.

The consumption of oils in the drying-oil industries is determined largely by the levels of manufacturing, building, and repairing activities, which, in turn, are generally closely related to the level of national income. Per capita consumption of paints, and so on, was low in 1932, increased steadily to 1937, and declined somewhat in the next 3 years; it then rose to a peak in 1941, largely because of war demands. Lack of supplies and manpower, and restrictions in civilian use caused consumption to decline after 1941.

There were 2,388 persons engaged in the production of linseed oil and oil cake (from both domestic and imported flaxseed) in 1939 and probably less than 250 engaged in the production of tung oil. The number employed in producing the oils for use in paint, etc., in the future will probably not change materially with changes in tariffs, but no doubt will with changes in national income. The number is likely to vary approximately with the output of paint.

POST-WAR SHORT TERM

Consumption of oils in paints and so on in the United States in 1939 was about 800 million pounds. Stimulated by the war, consumption exceeded 1 billion pounds in 1941. In the years immediately after the war, there will probably be a very large civilian demand for paint, varnish, and linoleum, because of the virtual suspension of building and repair activities during the war. Resumption of civilian demand may result in consumption of oils for paint, etc., nearly as high as occurred in the peak year, 1941 (about 25 percent higher than in 1939). Tung oil might supply 50-70 million pounds (less than in 1939 because of unsettled economic conditions in China and the increased availability of substitutes); oiticica oil, 20-30 million pounds; castor oil, 40-75 million; and soybean and fish oils, 75-100 million, leaving approximately 750-790 million pounds to be supplied by linseed oil. This would require about 40-42 million bushels of flaxseed. With continuation of Government support of flaxseed prices for at least 2 years after the war, it is probable that about one-half of the supply of flaxseed will come from domestic sources and the other half from foreign sources. Of the total quantity of oils used in paint, varnish, and linoleum, probably 50-55 percent, or 500-550 million pounds per year, would be from foreign sources.

POST-WAR LONG TERM

Consumption, Production, Imports, and Exports

Per capita income at 1939 level.

Under this level of income the quantity of oils consumed in paints, and so on, might be expected to be 15-20 percent higher than in 1939, principally because of the larger population but partly because of a

slightly higher level of building activity (resulting from the sharp curtailment in civilian construction during the war period). The total quantity of oil used in paints might therefore be expected to amount to 930-970 million pounds annually.

The total quantity consumed might be expected to vary only slightly with changes in the levels of tariffs, principally for the following reasons: (1) Changes in duties, not exceeding 50 percent, could not result in large changes in the prices of any of the finished paints, varnishes, and so on, and (2) the cost of paints, and so on, ordinarily represents only a small part of the total cost of applying them. (For example, probably only about one-fifth of the cost of having a house painted is represented by the cost of the paint, most of the balance being accounted for by the cost of labor.) The total value of the oils used in paints, and the proportion supplied by imports, would probably change substantially with changes in the rates of duty, principally because of the importance of flaxseed among imports.

Flaxseed was subject to a duty of 65 cents a bushel in 1939 but is now subject to a trade-agreement rate of 32½ cents. (Under the terms of the trade agreement, however, this rate is to be advanced to 50 cents 30 days after the President announces the termination of the existing "abnormal situation" of the trade in flaxseed.) The rate of 65 cents per bushel on flaxseed in 1939 corresponded to a rate of about 48 cents on the oil content of the seed, inasmuch as a drawback of approximately 17 cents was paid on the export of the oil cake.³ A change in duty amounting to 50 percent of a 48-cent rate could be expected—in the absence of a "control program"—to have an important effect on the domestic price of flaxseed and on the proportion of domestic consumption supplied by imported flaxseed.

Changes in the rates of duty of other oils used principally in paint, varnish, and linoleum probably would not have any important effect on either the foreign values of such oils or on the prices of any important domestic oils. Tung oil and oiticica oil are free of duty, and supplies of them are not quickly changed; and the duty on castor beans is low. The demand for soybean and fish oils for use in paints, and so on, is not likely to be an important factor in determining their prices.

Exports of oils used in paint, varnish, and linoleum will probably be small irrespective of the levels of tariffs and of income in foreign countries. There are no drying oils produced in the United States which foreign countries could not ordinarily obtain at least as advantageously from other sources; most of these oils they could obtain from other sources at lower prices than in the United States.

The estimates shown below are based on allocations of a total consumption of 930-970 million pounds as follows: Tung oil, 90-110 million pounds; oiticica oil, 20-30 million; castor oil, 30-50 million; soybean and fish oils, 65-85 million; and linseed oil, 690-730 million (equivalent to 36-38 million bushels of flaxseed). The proportions of these oils supplied by imports are assumed not to change materially with changes in tariffs except in those of flaxseed. With the duty at the present level, imports of flaxseed (unless influenced by government action other than through the tariff) might account for about

³ The drawback paid on exports of cake varies not only with the rate of duty on flaxseed but also with the relative values of the cake and oil obtained from the seed. For the purposes of this report, however, no great error is introduced by assuming that the drawback varies only with the tariff level.

19 million bushels; at 50 percent lower duties, for about 24 million; and at 50 percent higher duties, for about 14 million. Prices of foreign and domestic oils are assumed to be 10 percent above the 1939 level on the premise of no changes in duties. Changes in duties would probably affect principally the prices of linseed oil and flaxseed but to some extent also the prices of soybean and fish oils. Lower duties would operate to decrease domestic prices and to raise foreign prices; and higher duties would have the opposite effects.

Estimates of United States production, imports, and consumption of fats and oils in paint and varnish, oilcloth and linoleum, and printing ink, with income as in 1939, under various tariff levels, are shown below:

Tariff treatment	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Duty as in 1939:						Percent
Quantity (million pounds).....	448	3	445	805	960	83
Value (million dollars).....	41	(1)	41	40		
Duty reduced by 50 percent:						
Quantity (million pounds).....	359	4	355	610	955	63
Value (million dollars).....	31	(1)	31	49		
Duty increased by 50 percent:						
Quantity (million pounds).....	532	2	530	405	935	43
Value (million dollars).....	52	(1)	52	53		

¹ Less than \$500,000.

² Foreign value.

Per capita income 75 percent higher than in 1939.

Such an increase in national income would probably stimulate building activity sufficiently above the 1939 level to require a greatly increased amount of oils for paint, varnish, and so on—possibly 1.1–1.3 billion pounds, or over one-quarter more than estimated on the basis of the 1939 level of income and 40–60 percent more than the amount actually consumed in 1939. The total quantity used in these circumstances would probably not be appreciably affected by changes in the levels of duty, for reasons previously indicated. In the absence of tariff changes, prices of soybean and fish oil might be about the same as in 1939; prices of tung might be 35 to 45 percent higher; and linseed oil and most other oils about 20 to 30 percent higher. Changes in tariffs would affect prices principally of linseed oil. Because of the importance of linseed oil in the total consumption of oils used in paints, etc., changes in the rates of duty would have a considerable effect on the total value of the oils used in paints and on the share derived from imported materials. Lower duties would operate to decrease domestic prices both of flaxseed and of linseed oil and to increase their foreign prices. Higher duties would have the opposite effects.

The estimates shown below are based on allocations of a total consumption of 1.1–1.3 billion pounds as follows: Tung oil, 180–200 million pounds; oiticica oil, 30–50 million; castor oil, 50–70 million; soybean and fish oils, 90–130 million; and linseed oil, 765–835 million. (This quantity of linseed oil would be equivalent to 40–44 million bushels of flaxseed.) It is assumed that the proportion of the above oils supplied by imports would not change materially with changes in

duty except on flaxseed. With the duty at the 1939 level, it is estimated that imports would supply 20-22 million bushels; with the duty 50 percent below the 1939 level, 26-28 million; and with the duty 50 percent above the 1939 level, 14-16 million.

Estimates of United States production, imports, and consumption of fats and oils used in paint and varnish, oilcloth and linoleum, and printing ink, with income 75 percent higher than in 1939, under various tariff levels, are shown below:

Tariff treatment	Production			Imports	Appar-ent con-sumption	Ratio of imports to con-sumption
	Total	For export	For domestic market			
Duty as in 1939:						Percent
Quantity (million pounds).....	530	5	525	675	1,200	56
Value (million dollars).....	54	1	53	172		
Duty reduced by 50 percent:						
Quantity (million pounds).....	431	6	425	800	1,225	65
Value (million dollars).....	42	1	41	183		
Duty increased by 50 percent:						
Quantity (million pounds).....	619	4	615	560	1,175	47
Value (million dollars).....	66	1	65	162		

¹ Foreign value.

Part V. Fats and Oils Used in Miscellaneous Manufactured Products

Tariff paragraph: 52, 53, 54, 701, 1727, 1730 (b), 1732.

Commodity: Fats and oils used in miscellaneous manufactured products.

Rate of duty: Free to 5¢ per pound. Equivalent ad valorem (1939): 0-108% (weighted average including duty free imports, 30%).

NOTE.—For statement of tariff history see p. 196.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Appar-ent con-sumption	Ratio of imports to con-sumption
	Total	For ex-port	For do-mestic market			
Quantity (million pounds).....	272	12	260	272	532	Percent
Value (million dollars).....	114	1	13	112		51

¹ Estimated.

² Estimated foreign value.

The quantity of fats and oils used in miscellaneous manufactured products (other than in food, soap, paint, and related products) in the United States in 1939 was 530 million pounds, or about 6 percent of the country's total consumption of fats and oils used for all purposes. Slightly more than 50 percent of this quantity came from foreign sources, or about 3 percent of the total consumed for all purposes.

The principal domestic fats and oils used in these miscellaneous products were inedible tallows and greases, fish oils (including fish-

liver oils), soybean oil, and cottonseed oil foots. The fats and oils of foreign derivation consisted principally of palm oil, castor oil, fish oils (including fish-liver oils), marine-mammal oils, olive oil, and coconut oil. The products into which these fats and oils entered are extremely varied. They include vitamin products, rubber, insulation compounds, tin and terne plate, core oil compounds, metal-working compounds, hydraulic brake fluids, linings and patchings, resins, textiles, coated fabrics, natural leather, artificial leather, glue and adhesives, pharmaceuticals, toilet articles, disinfectants, detergents (other than soap), fatty acids, candles, lubricating oils and greases, and many others.

The inedible tallow and greases are used largely in the production of lubricating greases and fatty acids, and fish oils also are used to some extent in making fatty acids. The fatty acids, in turn, are used in the production of soaps, synthetic resins, candles, rubber, and cosmetics. (Tallow, greases, and fish oils enter into other miscellaneous products as well.) The fish-liver oils, which contain vitamins A and D, are used chiefly for human and animal nutrition. Cod oil is used largely in the leather industry; sperm oil is used in the textile, leather, and metal-working industries and also in making specialized lubricants; and rapeseed oil is used largely in making lubricants for marine reciprocating engines. Palm oil is used chiefly in the tin and terne plate industries. Castor oil is used in hydraulic brake fluids and emulsion breakers, in the textile and leather industries, and as a medicinal. Inedible olive oil is used largely in the textile industry, and the lauric-acid oils (coconut, palm-kernel, babassu, and ouricury) are used in the production of synthetic rubber, safety glass, and certain other specialized products such as hydraulic brake fluids and additives for lubricants.¹ Wool grease is used in treating leather and cordage, in making cooling compounds, lubricants, ointments, cosmetics, and so on.

The consumption of only a few fats and oils entering into only a small number of miscellaneous products can be predicted with any degree of accuracy. Estimates could be made, for example, of the amounts of fish-liver oils that will enter into vitamin products and the amounts of palm oil that will go into tin and terne plate. But it would not be feasible to make estimates for every fat and oil that will enter into each miscellaneous product. The list of such products not only is being constantly changed but is growing. Consumption of fats and oils in miscellaneous products in 1943, for example, was nearly twice as high as in 1939.

In view of the foregoing considerations, no attempt is here made to arrive at estimates of the amounts of fats and oils that will enter into any of the individual miscellaneous uses. Instead, the estimates are based on the consumption in all miscellaneous uses in 1939, taking into account: (1) The rising secular trend of consumption; (2) the highly inelastic nature of the demand for most of the miscellaneous products; and (3) the limited degree of competition between some of the more important foreign and domestic oils entering into miscellaneous uses. The quantity and value of the total consumption might

¹ In most of these uses, the lauric acid is the constituent of the oil that is desired; and, inasmuch as all of the lauric-acid oils contain substantial and not greatly differing percentages of this acid, it is largely a matter of indifference which of them is used. For some uses, however, the still lower molecular weight acids, such as caprylic, are desired. These acids occur in these oils in much smaller percentages than in lauric acid, and the percentages vary somewhat. Coconut and ouricury oils, for example, contain larger percentages of the lower molecular weight acids than does palm-kernel oil; they would therefore ordinarily be used in products requiring such acids.

therefore be expected to rise and to be very responsive to changes in per capita income but not very responsive to changes in tariffs.

POST-WAR SHORT TERM

During the war period, consumption of fats and oils in miscellaneous products was at a much higher level than in 1939, partly because of the increased production of miscellaneous products of the kinds previously made and partly because of the production of new articles, especially those needed by the military. Consumption in the early post-war period might be expected to be about midway between the levels of consumption in 1939 and in 1943, which would be 650-750 million pounds annually.

POST-WAR LONG TERM

Consumption, Production, Imports, and Exports

Per capita income at 1939 level.

At these levels, the quantity of fats and oils consumed in miscellaneous manufactured products might be about 15 to 25 percent higher than in 1939, partly because of the increased population and partly because of the development of new miscellaneous products or processes into which fats and oils enter. The total quantity consumed in all miscellaneous uses might therefore be 600-660 million pounds annually. Prices might be expected to average about 10 percent higher than in 1939, on the premise of no change in duties.

It is not likely that changes in duty would result in any material change either in the quantities of individual fats and oils consumed or in the total quantity consumed. The demands for most of the miscellaneous products under review are highly inelastic. Moreover, some of the more important foreign oils (including those derived from imported materials) enter free of duty, such as cod and cod-liver oil, fish livers and the palm oil used for tin and terne plate; or are subject only to low rates of duty, such as castor beans and most fish-liver oils other than cod and cod-liver. Changes in the rates of duty would affect principally the prices of domestic tallow and greases, fish oil, and linseed oil; but they would probably have little effect on the foreign prices of any with the exception of flaxseed.

Estimates of United States production, imports, and consumption of fats and oil in miscellaneous uses, with income as in 1939, under various tariff levels, are shown below:

Tariff treatment	Production			Imports	Appar-ent con-sumption	Ratio of imports to con-sumption
	Total	For export	For domestic market			
Duty as in 1939:						<i>Percent</i>
Quantity (million pounds).....	325	15	310	330	640	52
Value (million dollars).....	18	1	17	18		
Duty reduced by 50 percent:						
Quantity (million pounds).....	317	17	300	350	650	54
Value (million dollars).....	15	1	14	17		
Duty increased by 50 percent:						
Quantity (million pounds).....	233	13	220	310	630	49
Value (million dollars).....	21	1	20	15		

¹ Foreign value.

Per capita income 75 percent higher than in 1939.

This increase in income would probably result in a sharp rise in the demand for the miscellaneous products into which fats and oils enter. The quantity of the fats and oils thus consumed might be within the range of 700-800 million pounds, or about one-sixth more than estimated on the basis of the 1939 per capita income level and about 30-50 percent higher than in 1939. On the basis of unchanged tariffs, the unit prices of tallows and greases would probably be about 10 percent lower than in 1939; the unit prices of castor oil might be 20-30 percent higher; and those of fish-liver oils about 30-50 percent higher.

The level of tariffs would affect principally the proportion of the consumption of tallows, greases, and linseed oil supplied from domestic sources, but would probably have little effect on the consumption of palm, castor, and fish-liver oils or such other imported oils as are on the free list (or subject only to a low rate of duty) and which meet little direct competition from domestic fats and oils. Decreases in duties would operate to lower prices principally of domestic tallows and greases, fish oil, linseed oil, and flaxseed; and to raise foreign prices of flaxseed; increases in duty might be expected to have the opposite effects.

Estimates of United States production, imports, and consumption of fats and oils in miscellaneous uses, with income 75 percent higher than in 1939, under various tariff levels, are shown below:

Tariff treatment	Production			Imports	Appar-ent con-sumption	Ratio of imports to con-sumption
	Total	For export	For domestic market			
Duty as in 1939:						<i>Percent</i>
Quantity (million pounds).....	385	20	365	380	745	51
Value (million dollars).....	19	2	17	121		
Duty reduced by 50 percent:						
Quantity (million pounds).....	378	23	355	405	760	53
Value (million dollars).....	18	2	16	122		
Duty increased by 50 percent:						
Quantity (million pounds).....	392	17	375	355	730	49
Value (million dollars).....	19	1	18	119		

1 Foreign value.

SCHEDULE 2. EARTHS, EARTHENWARE, AND GLASSWARE, AND RELATED ITEMS PROVIDED FOR IN THE FREE LIST

INTRODUCTION AND SUMMARY

Below are presented separate comments on all items covered by schedule 2 of the Tariff Act of 1930 which come within the scope of Senate Resolution 341. The only exceptions to this statement relate to certain so-called basket classifications, which are as follows:

Commodity	Tariff paragraph No.	Duty status	Value of imports, 1939
Lime and limestone.....	203	Dutiable.....	\$109,385
Earthy and mineral substances, n. s. p. f.....	214	do.....	255,884
Carbons and electrodes.....	216	do.....	160,905
Biological, chemical, etc., articles of glass.....	218 (a)	do.....	175,170
Alabaster and jet.....	233	do.....	153,904
Altars, pulpits of marble, etc.....	1,774	Free.....	236,089
Quartzite, n. s. p. f.....	1,775	do.....	199,454
Stained windows and pictorial paintings on glass (works of art).....	1,810	do.....	141,355
Total.....			1,432,046

Each of these basket classifications covers many unrelated articles which are subject to different influences. For such classifications it would be clearly impossible to say anything significant concerning the effects of changed conditions resulting from the war, on post-war consumption, production, imports, exports, or employment, and still more impossible to make significant estimates.

Imports of the 24 dutiable articles or groups of articles which fall under this schedule and upon which report is made were valued in 1939 at 22.8 million dollars, an amount which constituted 92 percent of the total value of all commodities imported under this schedule. In addition, report is made on 5 free-list items which are related to the items dutiable under schedule 2. The total value of the imports of these free-list items in 1939 was 10.5 million dollars.

Estimates of post-war production (for the domestic market) and post-war imports of these reported articles have been totaled. (Where the estimates are not given in a single figure but in the form of a probable range, the middle point of the range has been taken for purposes of tabulation). The following tabulation compares these

total estimates with actual production for the domestic market and actual imports in 1939:

Period, income level, and tariff treatment	Production for domestic market		Imports	
	Value	Ratio to 1939	Foreign value	Ratio to 1939
<i>Earths, earthenware, and glassware, dutiable and free</i>				
Dutiable items:	<i>Million dollars</i>	<i>Percent</i>	<i>Million dollars</i>	<i>Percent</i>
1939.....	450.4	100	22.8	100
Post-war long term:				
Per capita national income same as in 1939:				
Duty as in 1939.....	544.2	121	30.5	134
Duty reduced 50 percent.....	533.8	119	39.5	173
Duty increased 50 percent.....	552.6	123	23.4	103
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939.....	1,051.1	233	57.9	254
Duty reduced 50 percent.....	1,030.6	229	74.5	327
Duty increased 50 percent.....	1,071.8	238	45.3	199
Related free items:				
1939.....	4.7	100	10.5	100
Post-war long term:				
Per capita national income same as in 1939:				
Per capita national income 75 percent higher than in 1939.....	5.5	117	13.3	126
Per capita national income 75 percent higher than in 1939.....	16.3	347	33.8	321

It should be emphasized that the production figures given above do not include production for export although, as indicated in the general introduction, the sections on particular commodities discuss the post-war export probabilities. It should also be emphasized that, as pointed out in the general introduction to this report, the estimates made for individual articles under the various assumptions in the resolution are subject to considerable, frequently wide, margins of error. In the estimates for articles in schedule 2 and for related free-list articles, the errors made are probably in both directions and thus may, to a considerable extent, offset one another. Nevertheless, the margin of error in the totals given above is doubtless considerable, possibly as much as 10 percent in either direction.

Taking the figures as they stand, however, they indicate the probability that, in the post-war long term, assuming no change in rates of duty, both production for the domestic market and imports will increase over 1939 by considerably more than the 10-percent increase in population, even if per capita national income remains the same as in 1939. The margin of possible error does not appear to be large enough to affect this conclusion. The probability of such an increase results from the fact that, even with per capita national income the same as in 1939, demand in the post-war long term for most of the important articles in the schedule—notably, magnesite, portland cement, and window and plate glass—will almost certainly rise faster than population. Moreover, the table shows that the estimates of production and imports under the assumption of higher income are almost double those under the assumption of per capita income the same as in 1939. This increase is forecast because a large part of the commodities covered by schedule 2 are either (a) materials for construction such as cement and glass; (b) materials which enter into other classes of capital goods, such as bauxite and mica; or (c) consumers' goods of a semiluxury or luxury character, such as pottery and

glassware. Demand for commodities of these three classes tends to increase greatly with a high national income.

Attention is called to the fact that for one of the important schedule 2 items on which report is made (bauxite) it is estimated that, if certain stated assumptions as to the imports and domestic production of aluminum should prove correct, imports in the post-war long term would be smaller with the duty reduced by 50 percent than under 1939 duties. (See the section on bauxite.)

MAGNESITE

Tariff paragraph: 204.

Commodity: Magnesite, dead-burned, grain, and periclase.

Rate of duty: 23/40 of 1¢ per lb. (\$11.50 per short ton).

Equivalent ad valorem: 64%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (short tons).....	86,077	0	86,077	44,420	130,497	Percent 34
Value (\$1,000).....	1,895	0	1,895	801		
Unit value.....	\$22		\$22	\$18		
Persons employed (number).....	700-800					

† Computed on basis of open market value, f. o. b. mines.
 * Foreign value.

Dead-burned magnesite (hereafter called magnesite, this section not covering either crude magnesite or caustic-calcined magnesite) is a basic refractory used in steel making and the smelting of non-ferrous metals, that is, in the construction, maintenance, and repair of furnaces. Since the bulk of the consumption is in steel making, the activity of the steel industry may be regarded as the controlling factor in the demand for magnesite. During the 1930's an average of about 4.7 pounds of magnesite was consumed per short ton of basic open-hearth and electric steel produced, but during the war, for various reasons, the ratio has been much higher—about 7 pounds per ton.

Domestic production of magnesite falls into two classes, the maintenance grade and the more valuable brickmaking grade (for making bricks for furnace linings); in weight, about 70 percent of the consumption is of the former and 30 percent is of the latter. In Austria, the principal pre-war source of imports (Manchuria was usually the only other significant source), all the output is of high enough quality for brickmaking, and European steel makers largely use this quality for both maintenance and brick. Before the war the unit value of the brick grade in the United States, on a comparable delivery basis, was about 10-20 percent higher than that of the maintenance grade.

Before the present war the United States produced almost exclusively the maintenance grade; the production was from ore mined in Washington, which could be converted into the brick grade only by somewhat costly processes. Almost the entire production was in the hands of one company which was jointly owned by two corporations. These corporations were, and still are, the principal manufacturers of magnesite brick and also manufacturers of many other refractory materials. By agreement between these two corporations and the Austrian producers, domestic consumption of the brick grade before the war was largely supplied by imports and little or none of the imported product was used for maintenance. In quantity, imports in 1939 were about 34 percent of consumption, but in value (on a comparable basis of delivery) the proportion was somewhat higher.

During the war imports have practically ceased. The largest domestic producer, mentioned above, has erected facilities for the production of brick-grade magnesite both from the ore (in Washington) and from sea water (in New Jersey). Another plant (in California) has become of some importance in the production of dead-burned magnesite. Certain other concerns, chiefly interested in the production of magnesium metal or of caustic-calcined magnesite, are also producing dead-burned magnesite and could produce much larger quantities. The United States has thus become self-sufficient in dead-burned magnesite. Annual consumption, of both grades combined, has risen to about 300,000 short tons, both because of the great increase in steel production and because, for certain technical reasons, the quantity of magnesite used per ton of steel has been abnormally large.

POST-WAR SHORT TERM

In the short-term period immediately following the close of hostilities the deferred civilian demand for steel is likely to maintain steel production at approximately war levels. In that case, however, the consumption of magnesite may be expected to be considerably below the wartime level of 300,000 tons annually because of a reduction from the abnormal consumption per ton of steel; the actual consumption may be between 210,000 and 235,000 tons. It is impossible to forecast what may be the imports of magnesite during the immediate post-war period. Conditions of production in Europe (especially in Austria) and Manchuria, and conditions of demand for magnesite in Europe and Japan, will be major factors. It seems doubtful whether, regardless of the rate of duty, imports in the immediate post-war period will be of much importance.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

It is probable that the production of basic open-hearth and electric steel would be about the same as in 1939 (49 million tons), but the increase of population might result in a total production of about 55-60 million tons. However, the per capita consumption of steel might so decline that total consumption would not increase over the

1939 level and might even decrease slightly. Assuming the quantity of magnesite used per ton of steel to be 4.7 pounds (as before the war), consumption of magnesite might range from 130,000 to 150,000 tons.

It is assumed that the pre-war restrictive agreement between domestic and foreign producers will not be restored. If there should be an agreement, there is of course no possibility of forecasting its character and its effects on imports. For reasons indicated above, variation in the quantity of imports (all or practically all of quality suitable for brick) will chiefly affect the domestic production of the brickmaking grade, domestic producers probably continuing to hold all, or much the greater part, of the market for magnesite for repair and maintenance work.

Duty as in 1939.—Consumption might possibly be supplied entirely, or almost entirely, from domestic sources. The two principal domestic producers have now facilities adequate to produce the entire national requirements of the brickmaking grade as well as the maintenance grade. Their costs (especially if allowance for depreciation and return on capital were reduced to a minimum) may readily be less than duty-paid prices of imports in the pre-war period. It is impossible to forecast, however, what will be the costs in foreign countries, especially in Austria and Manchuria. Imports at the present rate of duty might amount to 25,000–30,000 tons annually, depending on the total volume of consumption, with a foreign value at pre-war prices of from \$450,000 to \$550,000.

If imports should reach these figures, domestic production, depending on the volume of consumption, would probably be 105,000–120,000 tons, mainly of maintenance grade, with a value of perhaps 2.7–3.1 million dollars.

Duty reduced by 50 percent.—This reduction might result in considerably larger imports than would occur with no change in duty. The two largest consumers, however, might be disposed to use, as far as possible, the product of the domestic concern which they jointly own. The imports might range from as low as 15 percent to as high as 35 percent of the domestic consumption, or from 22,000 to 45,000 tons, with a foreign value, at the 1939 unit value, of from \$396,000 to \$810,000. Domestic production might range from 85,000 tons (minimum consumption with maximum percentage of imports) to 128,000 tons (maximum consumption with minimum percentage of imports). The value might reach about 2.0–3.3 million dollars, the value being affected by the proportion of the two grades in the output.

Duty increased by 50 percent.—It is probable that this increase would close the domestic market to all imports.

Per capita income 75 percent higher than in 1939.

Taking into account an increase in population, it is probable that the domestic production of steel would be approximately equal to the wartime production, say, 80–85 million tons of basic open-hearth and electric steel. In that case, assuming also that the average consumption of magnesite per ton of steel would revert to the pre-war level of 4.7 pounds, the total domestic consumption of magnesite would be between 190,000 and 200,000 short tons, or about 150–160 percent of the consumption in 1939.

Duty as in 1939.—Imports might range from 50,000 to 60,000 tons; the foreign unit value would probably be 10–15 percent higher than in 1939 and the foreign value of imports might reach 1.0–1.2 million dollars. Domestic production, depending on the volume of both consumption and imports, might range from 130,000 to as high as 150,000 tons. The unit value of each grade would probably be 10–15 percent higher than in 1939, and the total value would also be affected by the proportion of the two grades in production (which, in turn, would depend mainly on the magnitude of imports). The value of production might be 3.9–4.5 million dollars.

Duty reduced by 50 percent.—Imports might range from 30,000 to 70,000 tons (from 15 to 35 percent of consumption), with a foreign value (assuming an advance in prices) of \$610,000–\$1,425,000.

On the basis of the above estimates for consumption and imports, domestic production might range from 120,000 tons (minimum consumption with maximum percentage of imports) to 170,000 tons (maximum consumption with minimum percentage of imports), with a value of 3.6–5.1 million dollars.

Duty increased by 50 percent.—Even if the duty, which is specific, should be increased 50 percent, strong demand in the United States plus higher unit prices might permit some importation, although this possibility is problematical.

Exports

There is little reason to expect exportation of magnesite from the United States in the post-war period, whatever happens to world income or to rates of duty in foreign countries.

Employment

Employment in the domestic magnesite industry is small. Although the ratio of imports to production under different assumptions as to national income and rates of duty might have some effect on employment, other factors may readily prove to be more important. The number employed in producing a given quantity of magnesite in the later post-war period will be affected both by the ratio between production of sea water magnesite and that of magnesite derived from mined ore, and by possible changes in equipment and production methods in both these branches of the industry. Naturally, if more is produced in the United States, assuming the same efficiency of production, more labor will be employed, and vice versa, but it is impossible to state how much more or less.

CEMENT

Tariff paragraph: 205 (b)

Commodity: Roman, portland, and other hydraulic cement

Rate of duty: 4.5¢ per 100 lb. (including weight of container or 17¢ per bbl. of 378 lb. gross)

Equivalent ad valorem (1939): 18%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 6 cents per 100 pounds which was reduced to 4.5 cents, effective May 1, 1935, pursuant to the trade agreement with Belgium.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export	For domestic market ¹			
Quantity (1,000 barrels).....	122,651	1,146	121,505	1,891	123,396	Percent 1.5
Value (\$1,000).....	² 180,893	2,353	³ 178,540	⁴ 1,785		
Unit value (per barrel).....	\$1.47	\$2.05	\$1.47	\$0.94		
Persons employed (number).....	23,000					

¹ Shipments.

² Value in bulk, f. o. b. plants.

³ Foreign value.

⁴ Excess over unit value of production due to inclusion of freight charges to port of shipment, a charge for packaging (4 bags), and to a larger proportion (about 10 percent) of the relatively expensive white portland cement.

Practically all the cement produced in, or imported into, the United States, is of the portland type. Estimated distribution of United States uses of cement in 1936,¹ when consumption was about 7 percent less than that of 1939, was as follows: Building construction (commercial, public, residential, etc.), 34 percent; paving (highways, streets, runways, etc.), 23 percent; conservation (flood control, drainage, power projects, etc.), 14 percent; rural, 9 percent; sewers and water supply, 7 percent; bridges, 4 percent; railroads, 2 percent; and miscellaneous, 7 percent.

Pre-war import competition, largely from Belgium, was confined to seaboard markets, principally on the Atlantic coast, because of low ocean freight charges compared with heavy inland freight charges. Wartime imports have been negligible. Imports in 1939, the largest of any year during the thirties and 7 percent more than the annual average in 1936-39, supplied only 1.5 percent of total domestic consumption; at certain seaboard markets, however, they supplied from 5 to 20 percent of consumption. When cement was conditionally free of duty during most of the 1920's, annual imports did not exceed 2.3 percent of domestic consumption. An increase or decrease in the duty by 50 percent and changes in national income would not materially alter the ratio of imports to total consumption, but the ratio of imports to consumption in seaboard markets might be considerably affected. In contrast, interior markets would be little affected by such changes in the duty because a 50-percent reduction, amounting to 8.5 cents per barrel, is not sufficient to pay the usual switching charge on imported cement within metropolitan centers on the seaboard.

POST-WAR SHORT TERM

Because of the huge backlog in demand for construction accumulated during the war and of the projected Federal-aid highways and flood control, it seems likely that unusually large quantities of cement will be required in the immediate post-war period. Consumption,

¹ Source: Portland Cement Association; figures for later years are not available.

therefore, may be expected to rise above the 1939 level by more than the rise in real national income, possibly by as much as 50 to 60 percent over 1939. Domestic cement will probably supply more than 99 percent of consumption inasmuch as the rebuilding of cement plants in continental Europe and the huge reconstruction needs for cement therein will be likely to preclude sizable exports from Belgium and other European countries in immediate post-war years. Thus imports may be far below what they were in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Under both of the assumed per capita income levels, it is probable that three-fourths or more of the total domestic consumption of cement will be accounted for by heavy construction and nonresidential building, although the assumed expenditures for such construction represent about 58 and 54 percent, respectively, of the value of all construction under the lower and higher income levels. Thus increased residential construction will not increase cement consumption as much as it will increase the consumption of many other building materials.

Comments below regarding imports under the three duty levels (and under both income levels) are based on the assumption that cement-consuming markets on the seaboard will obtain their proportionate share of increased construction compared with 1939.

Per capita income at 1939 level.

Because of additional stimulation expected in cement consumption through demands in highway and airfield construction and in power projects and flood control, domestic consumption might increase about 20 percent over that of 1939 and thus amount to somewhere in the neighborhood of 150 million barrels. Domestic production for consumption (under the three duty levels listed below) would probably range from 147½ million to 148½ million barrels (or from 98.2 to 98.9 percent of consumption), with a value of from 216–218 million dollars on the basis of 1939 prices.

Duty as in 1939.—By the early 1950's, the European cement industry will probably have a sizable surplus available for export because plant rebuilding and the reconstruction of devastated areas should then be fairly well completed. Even then, however, imports of European cement into this country may be no more than 15 to 20 percent higher than they were in 1939, probably being somewhere in the neighborhood of 2¼ million barrels, with a foreign value of about 2.1 million dollars on the assumption of the same foreign prices as in 1939.

Duty reduced by 50 percent.—Imports might increase from 40 to 50 percent above those of 1939 and total, say, 2¼ million barrels (about 1.8 percent of consumption), with a foreign value of about 2.6 million dollars on the basis of 1939 import values.

Duty increased by 50 percent.—Imports might be 10 to 15 percent under those of 1939 and total about 1¾ million barrels, with a foreign value of about 1.6 million dollars on the basis of the same import values as in 1939.

Per capita income 75 percent higher than in 1939.

On the assumption that the value of all construction will be about 200 percent greater than that of 1939 (based on a 10- to 15-percent increase in prices), domestic consumption of cement might be about 160 percent greater than that of 1939, or in the neighborhood of 320 million barrels, the assumed increase of 178 percent in the value of nonresidential construction governing this estimate far more than the 230 percent increase in the value assumed for residential construction. Domestic production for consumption (under the three duty levels listed below) would probably range from 314½ million to 316½ million barrels (or from 98.2 to 98.9 percent of consumption), with a value of from 522 million to 525 million dollars on the basis of a 13-percent increase in price over 1939. In order to supply the foregoing consumption, the United States cement industry would have to increase its capacity by about 35 percent.

In comments relating to import values listed under the following headings, it is assumed that foreign prices will be about 13 percent higher than in 1939.

Duty as in 1939.—Imports might increase over 1939 in about the same proportion as the increase in total consumption (about 160 percent) and thus total about 4.9 million barrels, with a foreign value of about 5.2 million dollars.

Duty reduced by 50 percent.—At this tariff level, imports might increase in the neighborhood of 200 percent over that of 1939 and thus total about 5½ million barrels (about 1.8 percent of consumption), with a foreign value of about 6 million dollars.

Duty increased by 50 percent.—Under this increase, imports might be from 80 to 90 percent greater than those of 1939 and total about 3½ million barrels, with a foreign value of about 3.7 million dollars.

Exports

Under peacetime conditions, United States exports of cement, largely to Latin America, have seldom exceeded 1 percent of domestic production because the domestic industry has been unable to compete abroad with Belgian and other producers in the most widely used types of cement, except to a very limited extent. Much of the pre-war exports of domestic cement consisted of white portland cement, a relatively expensive type which was often purchased by Latin-American users on the basis of quality. In the immediate post-war years United States exports will probably increase over the 1939 level because European producers are not likely to have a surplus for Latin-American and other overseas markets. Plant rehabilitation and European needs for rebuilding devastated areas will tend to preclude a European surplus of cement at that time. Later, when European producers will again be competing actively in Latin American markets, United States exports will probably decline to about half a million barrels (about half that of 1939) and might have a value of about 1¼ million dollars. This level of exports prevailed during most of the thirties. Latin America will probably continue to reduce its imports because of its already expanding local cement industries.

Employment

Since the output per man-hour in the domestic cement industry has been steadily increasing, employment in the long-term period will probably not increase in proportion to increased production. If domestic production increases by 160 percent over that of 1939, employment may increase about 125 percent and wage earners might therefore number about 50,000. Probably no very substantial change in employment would take place because of a 50-percent decrease or increase in the duty.

BAUXITE

Tariff paragraph: 207.

Commodity: Crude bauxite, not refined.

Rate of duty: \$1 per long ton.

Equivalent ad valorem (1939): 14%.

NOTE.—See sections on aluminum and abrasives, under schedule 3.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export			
Quantity (1,000 long tons).....	375	(1)	520	895	Percent 58
Value (\$1,000).....	2,166		2,765		
Unit value (per long ton).....	\$5.77		\$7.24		
Persons employed.....	732				

¹ Considerable quantities of United States bauxite go into Canada, where it is converted into abrasive material and then returned to the United States.

² Foreign value.

In the past about 50 percent of world bauxite production has been used in the manufacture of aluminum, 25 percent in abrasives, and the remainder in chemicals, absorption media, refractories, and fluxes. Recently, however, the percentage of bauxite used in aluminum has increased to 70 percent or more.

Before the war the United States mines produced about 350,000 tons of bauxite annually, of which about 175,000 tons was used in the abrasive and chemical industries and about the same quantity in the manufacture of aluminum. Domestic bauxite has a relatively low alumina content; when used for aluminum production, it is generally blended with the higher-grade imported ores. The domestic product is, however, satisfactory for most other uses. Pre-war imports averaged about 371,000 tons, most of which was used for producing aluminum. Imports thus supplied about 53 percent of total consumption of bauxite and perhaps about 65 percent of the quantity used for the manufacture of aluminum. Nearly all the imports came from Surinam (Dutch Guiana). In the pre-war period the United States consumed about 30 percent of the world output of bauxite, whereas its known reserves were only about 4 percent of the known total.

The duty on bauxite, \$1 per ton, is equivalent to less than $\frac{1}{4}$ cent per pound on aluminum, which is now priced at 14 cents per pound; it has had no significant influence on the quantity of imports. Moreover, the foreign bauxite deposits which supply the United States market are controlled by the principal manufacturers of aluminum in this country. The same concerns also control the bulk of the domestic deposits of bauxite.

Consumption of bauxite, both for aluminum production and for other uses, has increased enormously during the war. The difficulties of transporting South American bauxite under war conditions has led to a very great expansion of domestic production. The already greatly depleted deposits of high-grade ore have been more sharply cut into. Facilities have been provided to beneficiate the lower grade bauxite ores, making it possible to use them for the manufacture of aluminum with less admixture of foreign bauxite. This process, however, is necessarily rather costly.

POST-WAR SHORT TERM

Consumption of bauxite, whether domestic or foreign, will depend largely on the disposition of Government stocks of both bauxite and aluminum. Should the large aluminum stocks be placed on the market, the primary aluminum industry might not operate even at pre-war levels. If, however, aluminum war stocks should not be marketed for some time, the domestic production would be much greater than before the war, although there might also be a considerable increase over pre-war figures in the imports of aluminum, especially if the rate of duty should be reduced. Under this assumption the domestic consumption of bauxite for the manufacture of aluminum would probably be much larger than before the war; the greater part of this class of bauxite would presumably be imported. The consumption of bauxite for chemicals, refractories, and abrasives would probably also be much greater than before the war, perhaps about 295,000 tons, and more than half of this would be supplied by the domestic industry. Both domestic production and imports of bauxite, therefore, would probably be decidedly higher than during the immediate pre-war years.

POST-WAR LONG TERM

Consumption, Production, and Imports

The following principal factors must be considered in estimating consumption, production, and imports of bauxite in the post-war long-term period:

(a) Bauxite is consumed mainly in the manufacture of aluminum, but large quantities are used for other purposes. Changes in national income decidedly affect consumption for all these uses.

(b) Even with national income at the 1939 level, the requirements for aluminum, and for bauxite for its manufacture, are likely to be much higher than before the war; the requirements of bauxite for other purposes might exceed the pre-war requirements only by the approximate percentage of increase in the population.

(c) Known domestic bauxite reserves are limited, and most of the domestic ore is inferior to imported ore for conversion into metal.

(d) Changes of 50 percent in the rate of duty on bauxite itself will have little effect on the relative proportion of the consumption supplied by domestic production and imports.

(e) Changes in the rate of duty on aluminum may have an important effect on the domestic production of that metal, and hence on United States demand for bauxite for conversion into aluminum. In the report on aluminum it is estimated that, even at the 1939 rate of duty, imports of the metal (unless limited by corporate relationships between domestic and foreign concerns) would be materially greater than before the war; that a 50-percent reduction in the duty would cause much larger imports still; but that an increase in the duty would lessen imports only moderately.

(f) Changes in duties on other commodities into which bauxite enters will have no significant effect on its consumption.

Table 1 presents estimates, necessarily approximate only, of the requirements for bauxite in the production of aluminum, under different assumptions as to levels of income and rates of duty on aluminum, together with estimates of consumption in other uses. The figures for consumption in aluminum merely express, in terms of bauxite, the estimates given in the section on aluminum.

TABLE 1.—*Bauxite: Estimated United States requirements under the assumptions of Senate Resolution 341*

[In thousands of long tons]

Period, income level, and tariff treatment	Production of aluminum	Bauxite requirements		
		For aluminum (mostly imported) †	For other purposes (mostly domestic)	Total
Average, 1935-38.....	115	‡ 494	‡ 212	706
Per capita national income as in 1939:				
Duties as in 1939.....	215-230	920- 990	230	1,150-1,220
Duties reduced by 50 percent †.....	180-210	775- 900	230	1,000-1,130
Duties increased by 50 percent †.....	230-235	990-1,000	230	1,220-1,230
Per capita national income 75 percent above 1939:				
Duties as in 1939.....	325-375	1,440-1,600	390	1,790-1,990
Duties reduced by 50 percent †.....	225-325	970-1,400	390	1,360-1,790
Duties increased by 50 percent †.....	375-400	1,600-1,700	390	1,990-2,090

† Assumes 4.3 tons of imported bauxite will be needed for 1 ton of aluminum.

‡ Estimated.

§ Principally effects of change in duty on crude aluminum, although a change in duty on bauxite itself might have some effect. (See text.)

Per capita income at 1939 level.

At the 1939 level of income, consumption of bauxite for purposes other than the manufacture of aluminum might, by reason of increase in population, be about 10 percent greater than before the war, or approximately 230,000 tons.

Duties on aluminum and bauxite as in 1939.—It has been estimated in the report on aluminum that, on this assumption, production of aluminum in the United States would be about 215,000-230,000 tons, requiring about 920,000-990,000 tons of bauxite. Of the bauxite consumed for this purpose, probably at least 80 percent would be imported, say, about 740,000-800,000 tons. The domestic production for this use would probably not exceed 180,000 tons. Of the estimated consumption of bauxite for other purposes, on the other hand,

a little more than half (perhaps 50–55 percent) would be produced domestically, or, say, about 120,000 tons.¹ Consequently, the total domestic production might be in the neighborhood of 300,000 tons, with a value, at approximately the pre-war prices, of about 1.8 million dollars. The imports might be valued, at pre-war prices, at 6.2–6.7 million dollars.

Duties reduced by 50 percent.—Reduction in the duty on bauxite would have little effect on the trade. On the other hand, the production of aluminum in the United States, with a reduction of 50 percent in the duty on that metal, would probably be considerably smaller than with no change in duties (assuming normal economic forces in operation). It might total about 180,000–210,000 tons, requiring about 775,000–900,000 tons of bauxite. Imports of bauxite, which supply the bulk of the material for the manufacture of aluminum, therefore, would presumably be somewhat less than with duties as in 1939. Taking account of the factors already discussed, it seems probable that the imports of bauxite might be between 700,000 and 830,000 tons, with a value of about 5.1–6.0 million dollars; and the total domestic production, practically not affected by the difference in duty, might be about 300,000 tons, with a value of roughly 1.8 million dollars.

Duties increased by 50 percent.—The consumption of bauxite in the United States for the production of aluminum would probably be somewhat greater than with no change in the aluminum duty, and consequently imports of bauxite would probably be somewhat larger. Imports might be between 920,000 and 930,000 tons, with a value of 6.6–6.7 million dollars. Domestic production would be about the same as with no change in duty.

Per capita income 75 percent higher than in 1939.

In the section on aluminum it has been estimated that the consumption of aluminum in the United States would be about 70 percent greater with income at this level than with income as in 1939. United States consumption of bauxite for the manufacture of aluminum would be affected by the rate of duty on aluminum; the effects would presumably be parallel to those estimated above on the basis of the lower income assumption. It is probable that the requirements for bauxite for other purposes would also be not far from 70 percent greater with a high national income than with income as in 1939. The high level of income would presumably involve some increase in the domestic and foreign prices of bauxite, but probably by not more than about 10 percent. (See report on aluminum regarding prices of the metal.)

It is doubtful whether the domestic production of bauxite (known reserves suitable for the manufacture of aluminum are very limited) could be increased in proportion to the increase in United States production of aluminum which would accompany high national income; the production of that type might be about 225,000 tons, or about one-fourth larger than with income as in 1939. Consequently, the imports of bauxite would presumably be much greater than estimated in the discussion of the lower income assumption. On the other hand, the domestic mines could probably increase their production of bauxite suitable for abrasives and chemicals sufficiently to take care

¹ A relatively small proportion of the bauxite going to aluminum plants is used for other purposes than for making crude aluminum.

of the increased demand for these purposes resulting from high national income. Taking these circumstances into account, the domestic production, consumption, and imports of bauxite under the higher income assumption may be roughly estimated in terms of quantity, as shown in table 2. Corresponding estimates as to unit prices and values for production and imports are presented in table 3.

TABLE 2.—*Bauxite: Estimated United States consumption, production, and imports under the assumptions of Senate Resolution 341*

[In thousands of long tons]

Period, income level, and tariff treatment	Consumption			Production			Imports, total ¹
	For aluminum	Other	Total	For aluminum	Other	Total	
1939.....	584	160	870	215	160	375	530
Per capita national income as in 1939:							
Duties as in 1939.....	920- 990	230	1,150-1,220	180	120	300	850- 920
Duties reduced by 50 percent ²	775- 900	230	1,000-1,130	180	120	300	700- 830
Duties increased by 50 percent ³	990-1,000	230	1,220-1,230	180	120	300	920- 930
Per capita national income 75 percent above 1939:							
Duties as in 1939.....	1,400-1,600	390	1,790-1,990	225	150	375	1,415-1,615
Duties reduced by 50 percent ²	970-1,400	390	1,360-1,790	225	150	375	985-1,415
Duties increased by 50 percent ³	1,600-1,700	390	1,990-2,090	225	150	375	1,615-1,715

¹ The greater part assumed to be all for production of aluminum.

² Principally effects of change in duty on crude aluminum, although a change in duty on bauxite itself might have some effect. (See text.)

TABLE 3.—*Bauxite: Summary of estimated United States production and imports under the assumptions of Senate Resolution 341*

Period, income level, and tariff treatment	Production			Imports		
	Quantity	Price per ton	Value	Quantity	Price per ton (foreign value)	Foreign value
1939.....	1,000 tons 375	\$5.77	1,000 dollars 2,166	1,000 tons 520	\$7.24	1,000 dollars 3,766
Per capita national income as in 1939:						
Duties as in 1939.....	300	6.00	1,800	850- 920	7.25	6,162- 6,670
Duties reduced by 50 percent ¹	300	6.00	1,800	700- 830	7.25	5,075- 6,017
Duties increased by 50 percent ¹	300	6.00	1,800	920- 930	7.25	6,670- 6,742
Per capita national income 75 percent above 1939:						
Duties as in 1939.....	375	6.60	2,475	1,415-1,615	8.00	11,320-12,920
Duties reduced by 50 percent ¹	375	6.60	2,475	985-1,415	8.00	7,890-11,320
Duties increased by 50 percent ¹	375	6.60	2,475	1,615-1,715	8.00	12,920-13,720

¹ Principally effects of change in duty on crude aluminum, although a change in duty on bauxite itself might have some effect (see text).

Exports

No exports³ of bauxite are expected, as the United States is deficient in high-grade ores. There should be substantial exportation of aluminum and abrasives but only as finished manufactures.

Employment

During high levels of domestic bauxite mining, employment has reached about 1,400 men, but during periods of lower activity this figure would probably be around 700. With deepening of the mines, there might be a tendency toward a slightly increased employment.

³ Shipments of bauxite ores to Canada, which are subsequently returned as abrasive material, are not considered as exports in this report.

CHINA CLAY OR KAOLIN

Tariff paragraph: 207.

Commodity: China clay or kaolin.

Rate of duty: \$1.75 per long ton (\$1.56 per short ton). Equivalent ad valorem (1939): 18%.

NOTE.—The rate fixed in the Tariff Act of 1930 was \$2.50 per long ton, which was reduced to \$1.75, effective January 1, 1939, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 short tons).....	781	115	1765	115	980	Percent 13
Value (\$1,000).....	6,201	1150	6,051	1,016		
Unit value (per short ton).....	\$7.94	\$10.00	\$7.90	\$8.85		
Persons employed (number).....	2,500-3,000					

¹ Estimated; statistics not separately reported.

² Approximate.

³ Foreign value.

China clay, or kaolin, is a high-grade clay. About three-quarters of that used in the United States goes into the paper and pottery industries; the remaining one-quarter, which is virtually all domestic, goes principally into the production of rubber, refractories, and cement.

In the early 1920's (1921-26) imports supplied about one-half of the total United States consumption of kaolin and a substantially larger part of the consumption in paper and pottery. Owing largely to the progressive improvement in quality and lower delivered prices of domestic kaolins, especially of paper clays, imports thereafter declined. By 1939 they supplied only 13 percent of total United States consumption and about 15 or 16 percent of that used in the paper and pottery industries, which use most of the imports. Since 1939, partly because of war conditions, imports have declined still further to about 6.5 percent of total consumption.

The decline in the use of imported kaolins has been particularly noticeable in the paper industry. Just before the beginning of the war imported clays supplied only about 10 percent of consumption in this industry; during the war the amount supplied by imports has fallen to less than 5 percent. Under the present duty, domestic kaolins possess a price advantage over imported kaolins at most points of consumption in the paper industry.

Since the late 1930's, imports of kaolin have gone principally into the pottery industry. However, the percentage of the pottery industry's consumption of kaolin supplied by imports fell from 40 percent before the war to about 30 percent in 1941-43. How much of this decline is due to war conditions cannot be determined. A large part of the pottery industry still prefers to use English china clay, although its delivered price is frequently somewhat higher than that of the domestic product.

Leaving the duty unchanged or decreasing or increasing it by 50 percent will have little effect on the United States consumption of kaolin and only a moderate effect on the volume of imports at a given level of national income. A 50-percent change in the duty equals 78 cents per short ton, equivalent to less than 5 percent of the average delivered price of paper and potting kaolin in 1939. Transportation charges from mines in England and the United States to points of consumption range from \$4 to \$15 per short ton, and a small change in these charges might offset the effects of a 50-percent decrease or increase in duty. After the duty was increased from \$1.25 to \$2.50 per long ton in the Tariff Act of 1922, average annual imports in 1923-26 rose about 55 percent above the average prevailing in 1919-21; however, since United States production between these two periods increased about 85 percent, this increase in imports actually represented a 5- or 6-percent decrease in the ratio of imports to total consumption. Although the duty on kaolin was lowered by 30 percent, effective January 1, 1939, imports in that year, which were little affected by the war, declined to less than the average for the preceding 3 years, whereas domestic production rose to a level higher than in any preceding year.

Throughout the remainder of this section it is assumed that the trend toward an increased use of domestic kaolins will continue, although possibly at a slower rate because of the continued preference of many domestic potters for English china clays.

POST-WAR SHORT TERM

Owing to higher national income and increased population, the domestic consumption of kaolin will probably be much higher than in 1939. The paper industry is using increasing quantities of clay (more than 600,000 tons in 1941), and the backlog of demand for all kinds of pottery products is expected to cause a large consumption of potting clays in the immediate post-war period. However, because of the tendency toward increased use of domestic kaolin, it may be that imports will not rise much, if any, above their 1939 level.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Considering the increase in population, domestic consumption of kaolin might increase about 15 percent above that of 1939, and the tonnage used, therefore, might be in the neighborhood of 1 million tons.

Duty as in 1939.—It seems probable that imports will constitute, say, 7-10 percent of total United States consumption in quantity. If so, they would amount to 70,000-100,000 short tons with a foreign value of \$620,000-\$886,000 on the assumption of the same import values as in 1939. Domestic production for consumption might then be somewhere between 900,000 and 930,000 tons, with a value of 7.1-7.3 million dollars on the basis of 1939 prices.

Duty reduced by 50 percent.—This reduction, amounting to 78 cents per short ton, might lead a few paper mills which had previously purchased the domestic product at a delivered price less than 78 cents

under the foreign to switch to imported clays. This change might add, say, 15,000–20,000 tons to imports, bringing them up to 85,000–120,000 tons (or 8.5–12 percent of consumption) with a foreign value estimated at \$750,000–\$1,060,000, based on the same import values as in 1939. Domestic production for consumption might then be 880,000–915,000 tons, with a value of 7–7.25 million dollars on the basis of 1939 prices. Increased imports of potting kaolin would probably be negligible because the saving in duty would not warrant the factory expense incidental to making a shift in raw materials.

Duty increased by 50 percent.—The increase of 78 cents in duty would have an effect the reverse of the decrease of that amount, and a few paper mills which before the war purchased the imported material at a delivered price somewhat less than 78 cents under the domestic might then shift to domestic kaolin. This change might reduce imports by, say, 15,000–20,000 tons, bringing them down to 50,000–85,000 tons (or 5–8.5 percent of total United States consumption) with a foreign value of somewhere between \$440,000 and \$750,000, assuming the same import values as in 1939. Domestic production for consumption might then be 915,000–950,000 tons, with a value of 7.25–7.5 million dollars on the basis of 1939 prices.

Per capita income 75 percent higher than in 1939.

Domestic consumption of kaolin might be about double that of 1939, or in the neighborhood of 1.75 million tons. This increase in consumption would result largely from the increased use of high-grade paper and from the high level of residential construction calling for such products as sanitary ware, tiles, and tableware. Imports would probably supply about the same proportion of consumption under each of the duty assumptions made below, as they would if national income should be at the 1939 level. The comments below are based on this assumption and, further, on the assumption that domestic and foreign prices will be about 10–15 percent above those of 1939.

Duty as in 1939.—Under all the assumptions made, imports, in quantity, would amount to 7–10 percent of consumption, or about 125,000–175,000 tons, with a foreign value of 1.25–1.75 million dollars. Domestic production for consumption might then be 1,575,000–1,625,000 tons, with a value of 14.0–14.5 million dollars.

Duty reduced by 50 percent.—This reduction would largely affect the purchases of those paper mills located where there is comparatively little difference between the delivered price of the domestic and imported clay. An increased differential favorable to the importers of 78 cents per short ton might permit them to increase sales by, say, 25,000–30,000 tons, thereby bringing total imports up to 150,000–205,000 tons (or 8.6–11.7 percent of consumption), with a foreign value of about 1.5–2.0 million dollars. Domestic production for consumption might then be 1.5–1.6 million tons, with a value of 13.75–14.25 million dollars.

Duty increased by 50 percent.—With a 78-cent differential in favor of the domestic producer, imports might be lower by 25,000–30,000 tons than they would be with no change in duty, that is, 100,000–145,000 tons (or 5.7–8.3 percent of consumption), with a foreign value of about 1.0–1.5 million dollars. Domestic production for consumption might then be 1,605,000–1,650,000 tons, with a value of 14.3–14.75 million dollars.

Exports

Statistics of exports of domestic kaolin are not separately reported. They are known, however, to be relatively small and have probably averaged less than 2 percent of domestic production for many years. Canada is the most important export market. International trade in kaolin has long been dominated by the English china-clay industry, which has large reserves of high-grade material.

Employment

Employment in the domestic kaolin industry ordinarily ranges from 2,500 to 3,000; Georgia normally accounts for about three-fourths of the total. If, however, domestic production increases by 100 percent in the 1950's, under an assumed per capita income 75 percent greater than that of 1939, the number of wage earners might reach 4,300-4,800. New refining processes, involving increased mechanization, have reduced labor requirements per unit of output during the last decade. If further new mechanical efficiencies are achieved, the number of persons employed in the post-war long-term period would be less than proportional to the estimated increased production.

FLUORSPAR

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
207-----	Fluorspar:		
	Containing more than 97 percent calcium fluoride.	\$4.20 per long ton---	18%
	Containing not more than 97 percent calcium fluoride.	\$8.40 per long ton---	112%

NOTE.—The rates fixed in the Tariff Act of 1930 were \$5.60 per ton on fluorspar containing more than 97 percent calcium fluoride and \$8.40 per ton on that containing 97 percent or less of calcium fluoride. The \$5.60 rate was reduced to \$4.20, effective January 1, 1939, pursuant to the trade agreement with the United Kingdom; and the \$8.40 rate was reduced to \$6.30, effective January 30, 1943, pursuant to the trade agreement with Mexico.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (short tons).....	182,771	2,976	179,795	16,302	196,097	Percent 8.3
Value (\$1,000).....	3,760	74	3,631	177		
Unit value (per short ton).....	\$20.27	\$25.01	\$20.19	\$10.84		
Persons employed (number).....	About 1,000					

† Foreign value.

Fluorspar, a nonmetallic crystalline mineral, is technically pure calcium fluoride, but the term fluorspar is also used in the trade to designate the ore from which the mineral is obtained. The ore is graded according to its content of calcium fluoride, of which the acid grade contains at least 98 percent, the ceramic grade from 95 to 98

percent, and the metallurgical grade at least 85 percent. The maximum silica content of the acid grade is 1 percent, of the ceramic grade 3 percent, and of the metallurgical grade 5 percent.

Run-of-the-mine fluorspar all over the world has in general the same calcium fluoride content. Formerly, acid and ceramic grades were obtained only in limited quantities by manual selection. In the 1930's, however, a mechanical process—selective froth flotation—was developed for converting run-of-the-mine ore into the higher grade acid and ceramic fluorspar. In 1943 the United States produced 124,000 tons of fluorspar of the higher calcium fluoride content by flotation.

Of the fluorspar consumed in the United States in 1939 72 percent was of the metallurgical grade, which is by far the most important flux used in the manufacture of steel by the basic open-hearth process; 11 percent was of the ceramic grade, which is used as an ingredient of opalescent glass, pottery, and enamel; and the remaining 17 percent was of the acid grade, the basis for the manufacture of hydrofluoric acid and many other fluoride chemicals. One of the most important of these chemicals, artificial cryolite, has largely displaced the natural mineral cryolite in the production of aluminum. Increasingly important uses of hydrofluoric acid are in the production of high-octane gasoline and in the manufacture of refrigerants and insecticides.

With the enormous expansion in aluminum production during the war, the use of acid fluorspar has much increased. Whereas in 1939 only 31,000 tons, or 17 percent, was of the acid grade, consumption of this grade rose in 1944 to 124,000 tons, or 30 percent of all fluorspar consumed. Consumption of the metallurgical grade was 100 percent greater in 1944 than in 1939 because of the increase in the production of open-hearth steel.

During the 1930's the United States was becoming practically independent of imported fluorspar, because the flotation process made it possible to satisfy most of the requirements for the ceramic and acid grades from run-of-the-mine material. In 1939, imports of the acid and ceramic grades represented approximately 6 percent of the domestic consumption of these grades, and imports of metallurgical fluorspar represented only 10 percent of the domestic consumption of that grade. Imports of ceramic and acid grades were probably brought in largely for special purposes, for which flotation material may not have been suitable. The small imports of metallurgical fluorspar usually came from western Europe and were used, it is believed, mainly in steel furnaces on the New England coast.

During the war the United States Government has encouraged Mexico to develop its large deposits of fluorspar with the result that the Mexican production in 1944 amounted to 80,000 tons, practically all of which was exported to the United States. In addition Aluminum, Ltd., of Canada, closely affiliated with the Aluminum Co. of America, has developed the substantial fluorspar deposits of Newfoundland.

In 1944 the fluorspar producers of New Mexico, Colorado, and other western States contributed about 100,000 tons, or 25 percent of the total domestic production of approximately 400,000 tons. Before the war these States had furnished only about 15 percent of the national production. As yet, these western producers have probably not encountered much competition from the imported Mexican

fluorspar because most of the Mexican product was brought in during the war by the United States Government free of duty, and apparently most of it was stock-piled. In late 1944 and early 1945 large quantities of the metallurgical fluorspar imported from Mexico were converted domestically into an acid-grade product. In making the estimates under Senate Resolution 341, this stock pile, the expansion of domestic production, and the possible post-war imports from Mexico and Newfoundland must be taken into consideration.

By 1944 the price of the metallurgical grade had increased 68 percent, and the price of the ceramic and acid grades had increased 46 percent above what they were in 1939. The greater increase in the price of metallurgical fluorspar narrowed the spread between the prices of the acid and metallurgical grades. In 1939 the metallurgical grade was \$12 cheaper than the acid grade, but in 1944 it was only \$6 cheaper. Apparently the increase in the price of the metallurgical grade was due largely to the lowering of the cost of converting this grade, by the flotation process, to the ceramic or acid grades. Thus, industries which formerly had to have acid or ceramic fluorspar became purchasers of metallurgical fluorspar, which they can convert to whatever grades they require. The price differential between the three grades of fluorspar will probably remain narrow and may even decrease during the immediate post-war period and the 1950's because of greater efficiency in conversion.

POST-WAR SHORT TERM

Consumption of fluorspar in the United States during the immediate post-war years may be nearly double what it was in 1939 because of the probability that the production of both steel and aluminum will be maintained at high levels and that the consumption of fluoride chemicals for the manufacture of high-octane gasoline and other products will be substantial. The volume of both domestic production and imports of fluorspar will depend on what is done with the Government's stock pile at the end of the war. If the stock pile is large and is liquidated rapidly, domestic production and imports would be smaller than if the stock pile is frozen or liquidated slowly.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Total consumption of fluorspar during the early 1950's may be somewhat more or somewhat less than 250,000 tons, depending in part on the assumptions as to duty. This estimate is based on an anticipated steel production of no more than 60 million tons, an anticipated aluminum production of no more than 300,000 tons, and a substantially increased production of fluorspar chemicals. Since it is probable that during the early 1950's the proportion of the higher priced acid and ceramic grades used will be larger than in 1939, the average price of fluorspar may be somewhat higher than it then was.

Duty as in 1939.—Because of the expansion of the Mexican industry—and probably, to a lesser extent, because of the expansion of the

Newfoundland industry—the quantity of imports may be twice as high as they were in the pre-war years (1936–39, inclusive) supplying 16 percent of consumption, or about 40,000 tons, having a foreign value of about \$440,000. This estimate assumes a foreign value of about \$11 a ton, approximately what it was in 1939. The quantity of imports here anticipated implies a domestic production of about 210,000 tons, with a value of 4.3 million dollars at 1939 prices.

Duty reduced by 50 percent.—If the duty is decreased by 50 percent, imports of metallurgical fluorspar may increase to as much as 80,000 tons, or 32 percent of consumption. Even though but little acid or ceramic fluorspar may be imported, considerable quantities of the metallurgical grade would probably be brought in, part of which would be converted to the higher grades. Imports in this quantity will probably have a foreign value of somewhat more than three-quarters of a million dollars, assuming an import price approximating that of 1939. The anticipated quantity of imports would imply a domestic production of about 170,000 tons, valued at about 3.5 million dollars.

Duty increased by 50 percent.—If the duty is increased by 50 percent, imports will probably not be much in excess of about 20,000 tons, or 8 percent of consumption, with a foreign value of about \$220,000. It is here assumed that even a higher duty will not result in a greatly increased price of fluorspar when national income is low. Domestic production would probably be about 230,000 tons, valued at about 4.5 million dollars.

Per capita income 75 percent higher than in 1939.

The total consumption of fluorspar during the early fifties may be 350,000 tons, or 75 percent higher than in 1939. This estimate is based on an anticipated steel production of 80–90 million tons, an anticipated aluminum production of 375,000–400,000 tons, and a greatly increased use of fluorspar chemicals.

Duty as in 1939.—Imports may amount to 17 percent of consumption, or about 60,000 tons, valued at more than \$650,000, and domestic production would probably amount to 290,000 tons, valued at 6.9 million dollars, allowing for a moderate increase in prices as compared with 1939.

Duty reduced by 50 percent.—Imports would probably amount to about 31 percent of consumption, or 110,000 tons, valued at possibly 1.7 million dollars. An average foreign value of about \$15 a ton is used in this estimate on the assumption that the importers would take advantage of the decreased duty to advance their prices, especially during a period of large national income. Domestic production would probably then be about 240,000 tons with a value of 5 million dollars.

Duty increased by 50 percent.—Imports might be about 8.5 percent of consumption, or 30,000 tons, most of which would probably be of the higher priced acid grade, on which the duty is relatively much lower. This grade would be especially predominant in imports if the Mexican producers introduce the flotation process. The average import value might then be as high as \$24 a ton, in which case the imports would have a foreign value of \$720,000. Domestic production might then total 320,000 tons, valued at 7.7 million dollars.

Exports

There is little reason to expect any appreciable exportation of fluorspar from the United States in the post-war period, regardless of world income or rates of duty in foreign countries. The mineral occurs in many countries, and most of them exploit their own deposits.

Employment

Employment in the domestic fluorspar industry is small. Approximately 500 men are employed for each 100,000 tons of fluorspar produced annually. Future employment may vary from 600 to 1,800 workers, depending on both per capita income and the rates of duty.

BALL CLAY

Tariff paragraph: 207.

Commodity: Clays, common blue and ball, unwrought

Rate of duty: \$1 per long ton (equivalent to about \$0.893 per short ton) Equivalent ad valorem (1939): 11%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export ¹	For domestic market			
Quantity (1,000 short tons).....	128.6	(²)	128.6	28.5	167.1	Percent
Value (\$1,000).....	935.7		935.7	³ 233		18.2
Unit value (per short ton).....	\$7.28		\$7.28	\$8.16		
Persons employed (number).....	⁴ 300-350					

¹ Statistics not separately reported.

² Negligible.

³ Foreign value.

⁴ Estimated.

Ball clay, including common blue clay, a type of ball clay occurring in England, is a highly plastic clay used almost entirely in the manufacture of pottery products, including sanitary ware, tableware, electrical porcelain, and art pottery, and in the manufacture of high-grade floor and wall tiles. The greater part of the tonnage used enters into three products—sanitary ware and tiles, used chiefly in residential construction, and tableware.

Virtually no imports of ball clay enter in the wrought or manufactured condition, dutiable at \$2 per ton. Imports, practically all from the United Kingdom, compete almost entirely with ball clays from Kentucky and Tennessee, which have been increasingly displacing the English product over an extended period. In 1936-39, average annual imports of 29,000 tons, valued at \$264,000, supplied about 20 percent of total United States consumption in quantity; since 1939, however, this ratio has declined to about 10 percent, partly because of war conditions and partly because of a combination

of other factors, including a continuation of the pre-war improvement in quality of the domestic product, further technological advancement in its use, and delivered prices lower than those of the imported product. Price differentials favoring domestic ball clays at consuming markets have often been as much as \$4 or \$5 per short ton. Imports, therefore, have entered largely on the basis of the preference which many pottery manufacturers have for English clays and their reluctance to change their complicated batch formulae after many years of satisfactory use.

A 50-percent change in the rate of duty on ball clay equals about 45 cents per short ton and is equivalent to about 2 or 3 percent of representative delivered prices. Inasmuch as the cost of ball clay used in most products is usually less than 5 percent of the total costs of production, the effect of a 50-percent change in the duty on such costs would be negligible. It appears, therefore, that the volume of imports might be little affected by a 50-percent increase or decrease in the duty.

Changes in national income will affect the activity of the ceramic industries and will, therefore, affect the consumption of ball clay. In forecasting the relative importance of imports, consideration must be given to the probable continuation of the long-established trend toward greater displacement of imported by domestic ball clay.

POST-WAR SHORT TERM

In immediate post-war years, United States consumption of ball clay might be about 50 percent greater than that of 1939 owing to increased demand arising from the production of sanitary ware and of floor and wall tiles used in residential construction and to increased demands by other ceramic industries, especially the industry making tableware. Assuming that domestic potters will tend to shift from imported to domestic ball clay, imports would supply a somewhat lower proportion of domestic consumption soon after the war than they did in 1936-39; they may thus account in this post-war period for about one-sixth of consumption instead of a fifth. Domestic production might then be about 53 percent greater than that of 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Based on an estimated expenditure for residential construction about 10 percent above that of 1939 and on increased demands by ball clay users making products not directly connected with such construction, domestic consumption might increase by about 10 percent over that of 1939 and thus amount to about 175,000 short tons. Assuming that in the early 1950's domestic ball clay will continue its gradual displacement of the imported product, imports are not likely to supply more than 15 percent of domestic consumption, whether the duty is changed or not. They might, therefore, be in the neighborhood of 26,000 tons, with a foreign value of about \$212,000, assuming prices to be about the same as in 1939. Domestic production might then be in the neighborhood of 150,000 tons (about 16.5 percent over 1939), with a value of about 1.1 million dollars on the basis of 1939 prices.

Per capita income 75 percent higher than in 1939.

On the assumption that the value of residential construction will be about 230 percent greater than that of 1939 (involving a huge increase in the consumption of sanitary ware and floor and wall tiles) and, further, that a much lower increase would take place in the consumption of clay-using products not directly connected with building, domestic consumption of ball clay might then be about 150 percent greater than that of 1939 and thus total in the neighborhood of 400,000 tons. As under the 1939 income level, imports are not likely to supply any more than 15 percent of consumption; they might, therefore, be in the neighborhood of 60,000 tons with a foreign value of about \$550,000, on the assumption of a 10-15 percent increase in foreign prices over 1939. Domestic production might then amount to 340,000 tons (165 percent over 1939), with a value of about 2.8 million dollars, likewise based on a 10-15 percent increase in price over 1939.

Exports

United States exports of ball clay have long been negligible, and there is little likelihood that exports will increase significantly after the war.

Employment

If domestic production increases by 165 percent in the 1950's, under an assumed per capita income 75 percent greater than that of 1939, then employment might increase by about the same percentage because the somewhat greater demand for processed domestic clay, requiring more labor, would offset the curtailment of labor through an anticipated increase in mechanization. Thus, wage earners might number between 800 and 925.

MICA

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
208 (a)-----	Sheet mica ¹ -----	4¢ per lb. + 25% ad val-----	35%
208 (c)-----	{ Sheet films-----	40%-----	40%
	{ Mica splittings-----	25%-----	25%

¹ Valued at more than 15 cents per pound.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export	For domestic market			
Quantity (1,000 pounds)-----	148	0	148	3,267	3,415	Percent
Value (\$1,000)-----	100	0	100	2,911		95.7
Unit value (per pound)-----	\$0.674	0	\$0.674	\$0.279		
Persons employed (number)-----	150					

¹ Exclusive of film.

² Foreign value.

Mica is a nonmetallic mineral, which is easily split into thin sheets. These sheets are flexible, transparent, water- and fire-proof, and are excellent insulators of heat and electricity. It is as an insulator of electricity that mica is principally used, especially in the manufacture of radio and radar apparatus. Substantial quantities of imported splittings are made in the United States into built-up mica plates which are used in place of natural sheets of mica as electrical insulation. Built-up mica plate, however, is not imported into this country in any appreciable amount and is not included in this report.

Imports of mica, which come very largely from India, comprise several kinds, qualities, and sizes, the most important being sheet mica with a foreign value of more than 15 cents per pound, mica splittings, and mica films. These are the only kinds here considered.

Sheet mica with a foreign value of more than 15 cents per pound is the most strategic type of mica, since only the best quality sheets have been found satisfactory as insulating separators in the manufacture of many types of essential radio condensers, radar, and other electronic equipment necessary in modern warfare. No completely satisfactory substitute for this purpose has been developed. United States production of sheet mica in 1939 amounted to 148,000 pounds valued at \$100,000. Imports which supplied about 80 percent of our requirements amounted to 600,000 pounds with a foreign value of \$237,000.

Mica splittings are sheets of mica not exceeding 12/10,000 of an inch in thickness. As indicated above, most of the splittings, practically all of which are imported, are used in making laminated plates—built-up mica—the thin splittings being cemented together with shellac or some synthetic resin. Although not possessing the high insulating value of the natural sheet, built-up mica has an insulation value sufficiently high for most purposes and is used especially where extra large sheets are required and where the working temperature is not high. Their principal application is in electric power and generating machinery. In 1939 imports of mica splittings, which supplied almost all of domestic consumption, amounted to 2,413,000 pounds with a foreign value of \$548,000.

Mica films are sheets of the better quality of mica, split to from 1/1,000 to 5/1,000 of an inch in thickness, and used in the manufacture of radio condensers. Most of the highest quality sheet mica, both that produced domestically and that imported into the United States, is converted in this country into mica films by manufacturers of radio condensers for their own use. It is estimated that domestic production of films amounted to 560,000 pounds in 1939, or about 70 percent of the total United States consumption. Imports of mica films in 1939 representing about 30 percent of the United States consumption, amounted to 254,000 pounds with a foreign value of \$126,000. During the war imports have supplied practically all of the United States requirements of mica film.

Sheet mica, mica splittings, and mica films are almost always incorporated into fairly expensive and often complicated apparatus and, though the mica is indispensable, it is used in such small amounts in each piece of apparatus that it represents a negligible part of the total cost. A great amount of hand labor is required in the production and preparation of mica and a country with extremely low wages (such as India, the principal producer and exporter) has an almost insuperable competitive advantage over countries with high wages.

A 50-percent increase or decrease in the duties on the kinds of mica here considered at any of the assumed income levels would probably have a comparatively small effect on quantity of United States consumption, production, or imports. The foreign unit value of imports would be somewhat larger if the duty were reduced and somewhat smaller if the duty were increased. Domestic production is achieved largely by the part-time employment of persons engaged principally in other activities.

POST-WAR SHORT TERM

In the immediate post-war years, domestic production and imports of mica will probably be somewhat less than in 1939 because of the reduction of the present large wartime stocks to pre-war levels by industrial concerns and the probable release of Government stocks of nonstrategic mica collected during the war period. This probability applies especially to splittings, which represent a major part of consumption and which have been stocked by industry and the Government in very large quantities. Consumption will probably be somewhat higher than in 1939, a substantial part of which will be supplied from stocks in the United States.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The total consumption of mica in the form of sheet with a foreign value of more than 15 cents per pound, as splittings and films, might probably amount to about 5.15 million pounds. Imports might supply about 97 percent of consumption and might amount to about 5 million pounds with a foreign value of 1.6 million dollars. Under these circumstances domestic production would amount to approximately 150,000 pounds valued at \$100,000.

Per capita income 75 percent higher than in 1939.

Total consumption of the three forms of mica here considered might amount to about 7.45 million pounds. Imports would supply about 98 percent of consumption and might amount to somewhat more than 7.3 million pounds, with a foreign value of about 2½ million dollars. Domestic production would amount to about 150,000 pounds valued at \$113,000.

Exports

The United States has never been and probably never will be on an export basis with respect to sheet mica, mica films, and splittings.

Employment

In ordinary times, very few people in the United States receive a major part of their annual income through production of sheet mica, and it is doubtful whether employment in this activity will increase significantly in the post-war years.

GROUND TALC

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
209-----	Talc, steatite or soapstone, and French chalk: Ground, washed, powdered, or pulverized (except toilet preparations):		
	Valued at not more than \$14 per ton (except French chalk)-----	17½% ad val.	}----- 29%
	Other (including French chalk)-----	35% ad val.	

NOTE.—The rate fixed in the Tariff Act of 1930 was 35 percent ad valorem, regardless of value. The duty on talc, steatite or soapstone, valued at not more than \$12.50 per ton, was reduced to 25 percent, effective January 1, 1936, pursuant to the first Canadian trade agreement. Pursuant to the second Canadian agreement, effective January 1, 1939, the rate was reduced to 17½ percent on talc, steatite, or soapstone valued at not more than \$14 per ton. The duty on other talc, and so forth, including French chalk, has remained 35 percent ad valorem, as originally enacted.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports ¹	Apparent consumption	Ratio of imports to consumption
	Total ²	For export ³	For domestic market			
Quantity (1,000 short tons)-----	236	6	231	26	257	Percent 10
Value (\$1,000)-----	2,541	95	2,500	408		
Unit value (per short ton)-----	\$10.75	\$19.00	\$10.80	\$15.73		
Persons employed (estimated number)-----	900					

¹ Includes a small quantity of pyrophyllite.
² Estimated; export classification includes figures for crude material and soapstone slabs.
³ Imports dutiable at 17½-percent rate: 13,800 tons valued at \$136,200 (value per short ton, \$9.86; computed specific rate of duty, \$1.73 per short ton).
Imports dutiable at 35-percent rate: 12,100 tons valued at \$272,000 (value per short ton, \$22.42; computed specific rate of duty, \$7.86 per short ton).
⁴ Foreign value.
⁵ Excess of this value over average unit value of production is due to inland freight to port of shipment and to quality slightly higher than average production.

Talc, steatite, soapstone, and French chalk are nonmetallic minerals similar in physical properties, being featured by their softness, and containing hydrated silicate of magnesium in varying proportions. The compact massive variety is usually known as steatite and the impure massive variety, containing as little as 50 percent talc, is generally called soapstone. French chalk, often referred to as tailor's chalk, is a soft, compact variety which will mark cloth. These varieties account for practically all of the imports and for most of the United States production; the term "talc" is used hereafter to designate them as a group.

Most of the United States consumption of talc, in both quantity and value, is in the ground form. About 30 percent of the domestic consumption of ground talc, in quantity, is in the paint (including putty) industry, and about 12-15 percent in each of the following industries: Ceramic, rubber, roofing material, and paper. Chief among other products using ground talc are toilet preparations, foundry facings, insecticides, and textiles. Because of inherent differences in physical and chemical properties, material from different deposits cannot be applied equally to all uses.

The United States is the world's largest producer and consumer of ground talc. Consumption in 1936-39 averaged about 234,000 tons annually, of which imports supplied about 11 percent; but the corresponding percentage in 1940-43, when similar consumption equaled 350,000 tons, declined to about 4.5 percent, and in 1942-43 it was only about 2 percent. This decline in imports was due largely to wartime conditions curtailing shipments from European sources and to a marked increase in domestic output. In 1936-39 Canada supplied about 53 percent and France 25 percent of the quantity imported in the lower price bracket, which constituted about half of the total. Of the other half, entered in the higher price bracket, Italy supplied 60 percent, France 19 percent, and Canada 9 percent. The foreign value of this part of the imports constituted about three-fourths of the value of all imports of ground talc.¹ Most of the small wartime imports have been supplied by Canada and entered largely in the lower-price bracket.

Much of the French talc and most of the Italian talc, especially that for cosmetics, have been imported on the basis of their high quality, but competition offered by Canadian talc with the domestic product has been largely direct.

Whether the duty remains unchanged or is decreased or increased by 50 percent, it will probably have little effect on United States consumption of ground talc.

POST-WAR SHORT TERM

The domestic consumption of ground talc is likely to rise above the war level, which is about 35 percent higher than in 1939, because the increased demand by certain industries, especially those supplying the building trades, will probably more than offset the decline in certain war-stimulated uses. Imports are likely to be above the 1939 level, but domestic production will probably supply a larger proportion of consumption than in 1939, domestic talc being particularly suitable and economical for products entering building construction.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Owing largely to the expected increase of 10 percent in population and the deficiency in housing facilities, domestic consumption of ground talc might increase about 15-20 percent above that of 1939, and the tonnage used, therefore, might be in the neighborhood of 300,000 tons.

Duty as in 1939.—It seems probable that imports will supply, as in 1939, about 10 percent of domestic consumption and thus amount to about 30,000 tons, with a foreign value at 1939 prices of about \$470,000, on the assumption of the same relation in entries under the two tariff brackets as in 1939. Domestic production for consumption might then be about 270,000 tons, with a value at 1939 prices of about 2.9 million dollars.

¹ From 1936 to 1938, by the first Canadian trade agreement, the lower value bracket went as high as \$12.50 per long ton, and by the second trade agreement with Canada, effective January 1, 1939, went as high as \$14 per long ton.

Duty reduced by 50 percent.—Imports might supply about 13 percent of domestic consumption and thus be in the neighborhood of 40,000 tons, with a foreign value of about \$690,000 at 1939 prices, but with some adjustment upward to account for the somewhat larger proportion of higher valued imports expected than in 1939. Domestic production for consumption might then be about 260,000 tons, with a value of about 2.8 million dollars on the basis of 1939 prices.

Duty increased by 50 percent.—Imports might supply about 7 percent of consumption and thus amount to about 20,000 tons, with a foreign value of about \$300,000 at 1939 prices, but with some adjustment downward because the proportion of higher valued imports is expected to be somewhat lower than in 1939. Domestic production for consumption might then be about 280,000 tons, with a value of about 3 million dollars on the basis of 1939 prices.

Per capita income 75 percent higher than in 1939.

At this income level, domestic consumption of ground talc might be in the neighborhood of 600,000 tons, an increase of about 130 to 135 percent over that of 1939 and double that already estimated under a per capita income the same as in 1939. Much of this increase in consumption will result from the high level of building construction and from demands in the diversified field of nondurable consumers goods using ground talc. Consumption of such goods, however, is expected to increase at a considerably lower rate than that of products used in building construction. Inasmuch as imports will probably supply, at the high level of construction, a lower proportion of the talc employed in building materials, imports are expected to supply a somewhat smaller part of total consumption than they would if per capita income should be at the 1939 level, because domestic talc is more suitable and economical than the imported talc for use in building materials.

The following estimates are based on the assumptions that domestic and foreign prices will be about 13 percent more than those of 1939 and that imports will consist of a somewhat larger proportion, say 60 percent, of the higher valued material than they did in 1939 (about 47 percent) owing to the high income assumed.

Duty as in 1939.—Imports might supply about 8 percent of consumption and thus be in the neighborhood of 50,000 tons, with a foreign value of about 1 million dollars. Domestic production for consumption might then be about 550,000 tons, with a value of about 6½ million dollars.

Duty reduced by 50 percent.—Imports might supply about 11 percent of consumption and thus amount to about 65,000 tons, with a foreign value of about 1.3 million dollars. Domestic production might then be about 535,000 tons, with a value of about 6½ million dollars.

Duty increased by 50 percent.—Imports might supply about 6 percent of consumption and thus amount to about 35,000 tons, with a foreign value of about \$700,000. Domestic production might then be in the neighborhood of 565,000 tons, with a value of about 6.9 million dollars.

Exports

Domestic exports of ground talc are not separately reported, as they are combined with the crude material and soapstone slabs. Available information indicates, however, that annual exports of the

ground material in 1936-39 averaged in the neighborhood of 4,000 tons with a value estimated at about \$80,000. Thus pre-war exports of ground talc probably accounted for less than 2 percent of domestic production in quantity and for about 3 percent of the total value. The United Kingdom was the principal export market.

There is little likelihood that the domestic talc industry will develop a sizable export trade in ground talc after the war. Only highly industrialized countries are large consumers of talc, and most of them have their own deposits or can obtain their requirements from nearby sources with relatively low transportation charges. The small tonnages used by nonindustrialized countries are predominantly high-grade material, such as that supplied by Italy and France.

Employment

Employment in the domestic ground talc industry is small; only about 900 wage earners were employed in 1939. If domestic production increases by 135 percent in the fifties, as is here estimated for a high level of national income, the number of wage earners might reach about 1,800.

POTTERY TABLEWARE

Tariff paragraphs: 211 and 212.

Commodity: Earthenware, stoneware, china and porcelain table and kitchen articles.

Rate of duty: From 30% + 5¢ per dozen pieces to 70% + 10¢ per dozen pieces. *Equivalent ad valorem (1939):* 69%.

NOTE.—The rates fixed in the Tariff Act of 1930 on earthenware and stoneware covered by this report were 10¢ per dozen pieces plus 45 or 50% ad valorem, depending on whether the ware was undecorated or decorated. The rates fixed in the act on chinaware and porcelain ware covered by this report were 60% on the undecorated and 70% on the decorated, with an additional duty of 10¢ per dozen pieces on all such ware. Duties on various items were reduced pursuant to the Czechoslovak, United Kingdom, and Mexican trade agreements, effective April 16, 1938, January 1, 1939, and January 30, 1943, respectively. The original tariff-act rates on the Czechoslovak items were restored April 22, 1939, upon the suspension of that agreement.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 dozen pieces).....	33,100	100	33,000	6,500	39,500	Percent 16
Value (\$1,000).....	138,900	1,200	138,100	4,700		
Unit value (per dozen).....	\$1.16	\$2.00	\$1.15	\$0.72		
Persons employed (number).....	18,000					

¹ United States factory value.

² Foreign value.

Pottery table and kitchen articles, used in preparing, serving, and storing food and drink, may be classified roughly into two groups: Opaque pottery known as earthenware, and translucent pottery known as chinaware. Chinaware is of two types, hotel china and household

china. Before the war practically the entire hotel-china market in this country was supplied by domestic production, but nearly all the household china was imported. The bulk of the household earthenware consumed in the United States was produced here. Although earthenware imports were substantial, the greater volume of competition with domestic earthenware came from imported chinaware, especially the cheap chinaware imported from Japan. In the 1920's, taking all types and grades together, imports came chiefly from Germany and other central European countries; in the 1930's they came chiefly from Japan. In both decades, the United Kingdom was the principal source of imports of the expensive grades of household china and earthenware.

The value of United States production of pottery tableware tripled between 1915 and 1923, remained high from 1923 to 1929, declined nearly to the 1915 figure in 1932, and rose to the average of the 1920's by 1940.

Since the beginning of World War I, there has been a strong general downward trend in the proportion of consumption, by value, supplied by imports; this trend, however, was interrupted during 1918-27, when the proportion supplied by imports rose substantially from the low level to which it had fallen in World War I.

From 1932 through 1937 total imports supplied, in terms of quantity, from 25 to 27 percent of United States consumption. Imports from Japan during this period supplied 18-23 percent and averaged 21 percent of consumption. During this period Japanese producers had the gradually diminishing benefit of a depreciated yen not fully offset by correspondingly higher Japanese costs. In 1929 and 1930, before the depreciation of the yen, Japan had supplied only 13 percent of United States consumption, or one-half the total quantity of imports in those years.

After 1937 the percentage of consumption supplied by imports, particularly imports from Japan, declined, total imports falling to 17 percent in 1938, 16 percent in 1939, and 14 percent in 1940. Thus, imports in 1939 cannot be taken as representative of imports in pre-war years. The two important factors causing this decline were the transition of Japan to a war economy and the boycott of Japanese goods in the United States.

After 1941, imports from Japan ceased entirely and the small imports which have continued during the war (representing about 2 percent of the quantity consumed) have come almost entirely from the United Kingdom. Domestic production increased about one-third from 1939 to 1943, but the total supply available for consumption increased only about one-fifth. Abnormally high civilian buying power, plus military requirements and restricted production, resulted in a demand much in excess of supply.

Pottery production is technically more efficient (i. e., owing to the use of improved mechanical equipment, fewer over-all man-hours are required per unit produced) in the United States than in any other country, although in recent years such efficiency has increased in all countries. So far as costs are concerned, however, the greater efficiency in the United States has continued to be more than offset by the lower wages in the pottery industries in foreign countries. In 1939 hourly pottery wage rates in Great Britain, Germany, and Japan (including perquisites in addition to direct wages) were about 40, 30,

and 10 percent, respectively, of those in the United States. Domestic producers, however, may gain some advantage from their nearness to the market, and ordinarily the delivery time from United States factories is shorter than from those abroad.

POST-WAR SHORT TERM

Demand will probably be considerably greater than in 1939, due to high national income and to the backlog of demand carried over from the war period. This demand will probably exceed the present productive capacity of the domestic industry (which is roughly 50 million dozen pieces per year). Under the conditions which are expected to prevail, imports may not exceed 50 percent of the 1939 quantity. England and, possibly, France and Czechoslovakia will most likely be the chief foreign sources of supply. It is assumed that there will be few, if any, imports of pottery from Japan and Germany in the post-war short term. It was the third year after World War I before Germany was able to export pottery to the United States in large quantities.

POST-WAR LONG TERM

Consumption, Production, and Imports

Assumptions regarding imports from Japan and Germany.

The most important factor in estimating the ratio of imports to United States consumption of table and kitchen pottery is the extent to which imports from Japan will be resumed; of some, but much less, importance is the extent to which imports from Germany will also recover. If it be assumed that imports from both these countries will not in the post-war long term become important factors in the United States market and that per capita income is at the 1939 level, total pottery imports would probably not attain anything like their 1939 proportion of domestic consumption regardless of what is done to the pottery tariff. Without large supplies from Japan or Germany, imports would not be likely, under these assumptions, to approach their 1939 figure of 6.5 million dozen pieces. It is possible, though not probable, that under the assumption of a 75-percent increase in real income per capita combined with a 50-percent reduction in duty, the quantity of imports might approach the 1939 level, even without any shipments from Japan or Germany. Under these assumptions, the value of imports might well rise somewhat above the 1939 level, partly because of a general rise in prices, including those of pottery, but also because imports from European countries other than Germany are much higher in price than those from Japan.

The estimates which follow are based on the assumption that the pottery industries in Japan and Germany will resume operations within a few years after the close of the war and that their products will receive as favorable treatment in United States markets as the products of the pottery industries of other countries. They are based also on the assumption that prices of pottery produced in the foreign countries, converted into dollars, will bear about the same relation to the prices of pottery produced in the United States as they did in 1939. Under these assumptions, Japan would again become a major factor on the United States market, but Germany's share of the domestic market in both quantity and value would very likely remain

much smaller than it was in the 1920's and would probably continue, as in most of the 1930's, to be much smaller than the share of Japan and possibly also smaller than the share of the United Kingdom.

Per capita income at 1939 level.

Duty as in 1939.—Per capita consumption of table pottery would probably be around the 1939 level, but with increase in population total consumption might vary from the 1939 figure to 10 percent or more above it. It might be 40–44 million dozen pieces. Imports would probably supply about the same proportion of consumption as during the 3 years 1936–38 (the figures for 1939, when imports from Japan, Germany, and Czechoslovakia were adversely affected by war preparations and by boycott, are not representative). Imports might thus be 20–25 percent of consumption, totaling 8–11 million dozen pieces, with a foreign value, at about the same unit values as in 1939, of 5.8–7.9 million dollars. Domestic production would be somewhere between 30 million dozen pieces (minimum consumption with maximum percentage of imports) and 35 million dozen pieces (maximum consumption with minimum percentages of imports), with a value, at 1939 factory prices, of 35–40 million dollars.

Duty reduced by 50 percent.—If reduced duties result in lower duty-paid prices of the imported products, consumption might be about 1 million dozen pieces more than with an unchanged duty, say, 41–45 million dozen pieces. The proportion supplied by imports would be higher than with an unchanged duty, and might range from 25 to 33½ percent. They would thus be 10–15 million dozen pieces, with a foreign value (at unit values probably somewhat higher than in 1939 because of a probable increase in the proportion of imports from Europe) of 8.5–13.0 million dollars. Domestic production in that case might range from 27 to 34 million dozen pieces, with a factory value, at 1939 prices (but allowing for some lowering of the proportion of better patterns), between 30 and 38 million dollars.

In the years 1933–37, when the Japanese had the advantage of a depreciated yen not offset by increased yen costs, they supplied 21 to 23 percent of United States consumption in terms of quantity. With a 50-percent reduction in duty, Japan might, according to conditions at the time, supply a somewhat smaller or a somewhat larger percentage than in those years. Imports from Europe, which supplied 4–5 percent of United States consumption in the years 1933–37, on the other hand, would probably supply a much larger proportion of consumption in the post-war long term because sales of higher priced European pottery were unusually low in the early 1930's, and because the assumed 50-percent reduction in duty would be superimposed upon the reduction in duty in the trade agreement with the United Kingdom on the types of pottery coming from that country and from continental European countries. Considerable quantities of hotel china might again be imported.

Duty increased by 50 percent.—Because of the higher duty-paid price of imported pottery, consumption might be a little less than with no change in duty, say, 39–43 million dozen pieces. The share of imports would be reduced, to, say, 15–20 percent of consumption, totaling 5.9–8.6 million dozen pieces, with a foreign value, at unit values possibly somewhat less than in 1939 (because imports from the higher-cost countries, particularly Great Britain, would be restricted), of 3.8–5.6 million dollars. Under these assumptions, domestic production would

be 31-37 million dozen pieces, with a factory value, at 1939 prices (but allowing for some increase in the proportion of better patterns), of 37-43 million dollars.

Per capita income 75 percent higher than in 1939.

With a given population the total quantity of pottery consumed tends to increase at nearly half the rate of increase in per capita income. The probabilities would seem to be that under each of the three assumptions concerning rates of duty the share of this increased consumption furnished by imports would be about the same as estimated in the preceding section, where per capita income is assumed to be the same as in 1939. The quantities of consumption, imports, and domestic production might, therefore, be 45-50 percent higher than the respective estimates made for the 1939 per capita income and the several rates of duty.

Increase in per capita income has a still greater effect in increasing the value of consumption since the consumers not only pay the higher prices generally accompanying higher income, but they also tend to buy better grades of ware. The unit values of both imported and domestic ware might be 30-40 percent greater, therefore, than those estimated under the respective rates of duty and per capita income at the 1939 level.

Duty as in 1939.—Taking account of increase in population, it seems likely that the quantity of pottery consumed would be 58-66 million dozen pieces. Imports (taken as 20-25 percent of consumption) would probably be between 12 and 17 million dozen pieces. The foreign value of imports, assuming a 30-40 percent increase in unit value, might be about 11-17 million dollars. On this assumption, domestic production would be 44-53 million dozen pieces, with a factory value of 66-84 million dollars.

Duty reduced by 50 percent.—Consumption might be within the range of 59-68 million dozen pieces (possibly 1-2 million more than with no change in duty). Imports (25-33½ percent of consumption) would then be 15-23 million dozen pieces, with a foreign value of 16-27 million dollars. Domestic production might amount to 39-51 million dozen pieces, with a factory value of 57-80 million dollars.

Duty increased by 50 percent.—With an increase in duty, consumption might be 57-65 million dozen pieces. Imports (15-20 percent of consumption), in that event, would probably be 8.6-13 million dozen pieces, with a foreign value of 7.2-12 million dollars. Domestic production might amount to 46-55 million dozen pieces, with a factory value of 70-90 million dollars.

Exports

United States exports of table and kitchen pottery will very likely decline to their pre-war level of \$100,000-\$200,000 annually by 1953, unless exports from Japan and Europe are restricted in some manner.

Employment

Employment in the United States industry in 1953 would probably vary, in accordance with the foregoing estimates of production, from about 13,000-15,000 under the 1939 income rate and increased import duties, to more than 30,000 if the per capita income were 75 percent higher and pottery import duties were increased 50 percent.

ART POTTERY

Tariff paragraph: 211 and 212.

Commodity: Art and decorative pottery.

Rate of duty: 40% to 70% or 50% + 10¢ per dozen pieces. Equivalent ad valorem (1939): 66%.

NOTE.—The rates fixed in the Tariff Act of 1930 on the articles covered by this report ranged from 60% to 70% on china and from 45% to 50% + 10¢ per dozen pieces on earthenware. Reductions in duties on various items were made in the trade agreement with the United Kingdom, effective January 1, 1939, and with Mexico, effective January 30, 1943.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 dozen pieces).....		(1)		5,650		Percent
Value (\$1,000).....	\$ 7,000	(1)	7,000	\$ 3,600	10,600	34
Unit value (per dozen).....						
Persons employed (number).....	\$ 3,500					

¹ Negligible.

² Estimated United States factory value.

³ Landed value; foreign value was \$1,943,000.

⁴ Estimated.

Pottery art and decorative ware includes earthenware, stoneware, china and porcelain vases, figures, lamp bases, and decorative bowls, ash trays, and similar articles.

Consumption of art and decorative pottery, while following changes in consumer income, shows a long-term upward trend since 1929. Whereas consumption amounted to 9 million dollars in 1929, it amounted to 10.6 million dollars in 1939, a year with a lower national income than 1929, and rose further to 12.6 million dollars in 1940 and to 14.2 million dollars in 1941.

At the same time that consumption of art pottery rose, the ratio of imports to consumption declined. That ratio was 66 percent in 1929, 53 percent in 1932, 50 percent in 1937, 34 percent in 1939, and 15 percent in 1941.

Before the war, imports came chiefly from Japan and Germany. Czechoslovakia, the United Kingdom, China, Italy, and France also supplied appreciable amounts.

Corresponding to the decline in the ratio of imports to consumption and to the increase of domestic consumption, domestic production has risen greatly during the 1930's. This rise received further emphasis with the outbreak of the war and with the cutting off of most of the foreign supplies. Domestic production is estimated to have doubled in value from 1939 to 1942. This increase was possible largely because of expanded plant capacity resulting from the construction of a large number of small art potteries, especially in California.

The domestically produced ware has on the average a higher unit value than the imported art pottery.

POST-WAR SHORT TERM

Consumption of art pottery may be expected to be high, possibly as much as 100 percent over 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Taking into account the increase of population and the upward trend of the value of the consumption of art pottery, consumption may be somewhat higher than in 1939, depending on the level of duty.

Duty as in 1939.—Consumption might be 10 percent higher than in 1939 and be valued at about 11.5 million dollars. Of this, imports may supply about 45 percent, with a landed value of about 5.2 million dollars and a foreign value of about 2.8 million dollars. Domestic production would have a factory value of about 6.3 million dollars.

Duty reduced by 50 percent.—Consumption might amount to about 10.5 million dollars. Imports might supply about 55 percent of consumption with a landed value of 5.8 million dollars and a foreign value of 3.8 million dollars.¹ Production might have a factory value of about 4.7 million dollars.

Duty increased by 50 percent.—Consumption might amount to about 12.5 million dollars.² Imports would supply about 40 percent of the amount consumed and would have a landed value of about 5 million dollars and a foreign value of about 2.3 million dollars. Production might then amount to about 7.5 million dollars.

Per capita income 75 percent higher than in 1939.

In view of the fact that art pottery is somewhat of a luxury, consumption of the commodity might be expected, with increased incomes, to increase at a relatively rapid rate, owing partly to purchase of articles of higher average unit value. It is estimated that consumption would double, more or less, depending on the rate of duty, what it would be if the per capita income were at the 1939 level.

Duty as in 1939.—Consumption might amount to about 22 million dollars. Imports would supply about 40 percent of consumption and would have a landed value of about 8.8 million dollars and a foreign value of about 4.7 million dollars. The factory value of production might thus amount to about 13 million dollars.

Duty reduced by 50 percent.—Consumption might amount to about 19 million dollars. Imports would supply about 50 percent of consumption and would have a landed value of about 9.5 million dollars and a foreign value of about 6.2 million dollars. The factory value of production might thus amount to about 9.5 million dollars.

Duty increased by 50 percent.—Consumption might amount to about 25 million dollars. Imports would supply about 35 percent of consumption and would have a landed value of about 8.8 million dollars and a foreign value of about 4 million dollars. The factory value of production might thus amount to about 16 million dollars.

¹ The ratio of foreign value of imports to their landed value changes in inverse proportion to the level of duty because the latter value includes not only transportation costs but also the duty paid on the merchandise.

² The value of consumption at increased rates of duty tends to be higher because larger quantities of domestic ware of relatively high average unit value tend to displace imported ware of lower average unit value.

Exports

Exports of art pottery are expected to remain negligible.

Employment

Employment might be as little as about 2,000 persons at the assumed lower level of post-war national income with import duties reduced by 50 percent, and it might be as much as about 6,000 persons with the per capita income 75 percent higher than in 1939 and with duties increased by 50 percent.

GRAPHITE, NATURAL

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
213	Amorphous, natural.....	5%	5%
	Crystalline flake.....	30%, with a specific minimum of 0.825¢ per lb. and a specific maximum of 1.65¢ per lb.	36%
	Crystalline lump, chip, and dust.....	15%	15%

NOTE.—The rates fixed in the Tariff Act of 1930 were 10% ad valorem on amorphous graphite, 30% ad valorem on crystalline lump, chip, or dust, and 1¢ per pound on crystalline flake. The rates were reduced to those indicated above pursuant to the trade agreement with the United Kingdom, effective January 1, 1939 (covering amorphous, and crystalline lump, chip, or dust), and the trade agreement with France, effective June 15, 1936 (covering crystalline flake).

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Apparent consumption
	Total	For export ¹		
Quantity (short tons).....	500	976	21,537	21,000
Value (\$1,000).....	24	110	410	
Unit value (per ton).....	\$48	\$112	\$19	
Persons employed (number).....	88			

- ¹ Refined and blended natural graphite.
- ² Estimated.
- ³ Foreign value.
- ⁴ Employed principally in refining and blending imported graphite.

Natural graphite is elemental carbon, dark gray to black, with a soft, unctuous feel and a metallic luster. It is classified for tariff purposes as crystalline flake and flake dust; crystalline lump, chip, and dust; and amorphous lump, chip, and dust.

Crystalline lump, chip, and flake graphite is used principally in the manufacture of metallurgical crucibles and other refractory products. Crystalline dust and flake dust graphite and amorphous graphite are used for making foundry facings, core washes, lubricants, and paints. Natural amorphous graphite is employed chiefly for pencils, dry batteries, shoe and stove polishes, and paints.

About 30 percent of the total domestic consumption of graphite is used in foundry facings and core washes, and about 15 percent in paints, pencils, and shoe and stove polishes. The crucible industry

accounts for only 10 percent of the quantity, but nearly 40 percent of the value of total consumption.

Since only negligible quantities of crystalline graphite of crucible grade are produced in the United States, domestic requirements are supplied almost wholly by imports from Madagascar and Ceylon. Domestic grades of graphite are suitable for most all purposes, except for making crucibles and pencils. Mexico supplies the bulk of the pencil-grade graphite. Imports of graphite for consumption in the United States, by kinds, for 1939, were as follows:

Commodity	Quantity	Foreign value	Unit value
	<i>Short tons</i>		
Amorphous, natural.....	18, 675	\$269, 046	\$14. 41
Crystalline flake ¹	2, 260	110, 466	48. 89
Crystalline lump, chip, and dust.....	602	30, 421	50. 58
Total.....	21, 537	409, 933	19. 08

¹ Includes imports of flake dust.

When, during the war, imports from Madagascar were shut off and Ceylon's output was required largely by Great Britain, the United States Government subsidized production of crystalline graphite in this country in the hope that a domestic supply of this much-needed crucible-grade material could be developed. Numerous tests by crucible manufacturers indicated that the domestic product, when used alone, was unsatisfactory except in the smaller sized crucibles. By the end of 1943, imports from Madagascar had been resumed, and the Government-financed plants were shut down. Domestic production, which increased to nearly 10,000 tons in 1943, now consists entirely of nonstrategic grades, and was estimated at 3,000-4,000 tons in 1944.

The prices at which different grades of graphite can be obtained is the sole determinant of what is used for foundry facings, core washes, paints, and shoe and stove polishes.

An uncertain factor in estimating the future imports of graphite relates to its use in crucibles. During the war silicon carbide has been used as a substitute for a part of the graphite in crucibles, and it is reported that though silicon carbide is more expensive, it improves the quality of the crucible for some uses. If this development leads to a reduction in requirements of crucible graphite, it would affect the value of total imports much more than the quantity.

POST-WAR SHORT TERM

Although graphite crucibles are likely to be needed in much larger quantities than before the war to reclaim nonferrous metals in copper and other alloys from enormous quantities of obsolete and scrap war material, a substantial part of the needs may be supplied from the large stocks of crucibles that have been accumulated during the war. If this possibility should prove true, imports of crucible-grade graphite might not be greater than in 1939. On the other hand, the probable increase in demand for graphite for lubricants and pencils of the better grades (production of which was greatly curtailed during the war)

might cause total imports of graphite in quantity to be as much as, say, 20 percent higher than in 1939, with a foreign value of about \$25 per ton, assuming foreign prices to be about 35 percent above the 1939 level. If, however, the stock of crucibles on hand at the end of the war should not be sufficient to meet the increased demand, then the quantity of imports might be as much as, say, 40 percent higher than in 1939. With the higher unit value of imports, owing to the larger proportion of crucible grades, the foreign value might be as high as \$33 per ton. In any case, production for domestic market, chiefly of the amorphous variety, might drop from 3,000-4,000 tons (1944) to 1,000-1,500 tons annually.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

During the early 1950's consumption of natural graphite in the United States might be at the average for 1936 and 1937, that is to say in the neighborhood of 24,000-26,000 tons.

Duty as in 1939.—Consumption would probably be supplied at approximately the same extent by imports and domestic production as in pre-war years. Four or five companies, all of which import, refine, and market graphite, have built up foreign contacts and domestic processing and distributing facilities over a long period of years. In the face of these arrangements and under existing tariffs, production for domestic market would probably not much exceed 1,000 tons. With prices about as in 1939 and 23,000-25,000 tons of imports, the foreign value of the imports would be \$450,000-\$550,000. The greater spread in the value than in the quantity is attributable to the larger proportion of the higher priced crystalline graphite.

Duties reduced by 50 percent.—This condition would not result in any large increase in imports since graphite is practically indispensable in most of its uses and since even under 1939 duties domestic production supplied only a small part of consumption. Imports would probably not increase by more than, say, 1,000 tons, or to 24,000-26,000 tons. Since the increased imports would be in the lower priced grades of graphite, the foreign values would probably be increased by a reduction of duties in less proportion than the quantities and might fall in the range of from \$440,000 to \$560,000.

Duties increased by 50 percent.—Since practically the entire supply of graphite is imported, an increase in duties might have little or no effect on consumption. Production of graphite for domestic market, however, may share up to 10 percent of requirements, and account for 2,500 to 3,000 tons. The value of this production might range from \$100,000 to \$165,000, depending upon the amount of crystalline graphite produced. Imports would then be from 21,000 to 23,500 tons with a foreign value of \$400,000 to \$520,000.

Per capita income 75 percent higher than in 1939.

In the early 1950's with per capita income at such a high level, it may be expected that 35,000-45,000 tons of natural graphite would be consumed annually. This would represent an increase of 60-110 percent over consumption in 1939. With such a rate of industrial activity, prices of graphite would probably be somewhat higher than

they were in the pre-war years, possibly on the average of 10-15 percent.

Duties as in 1939.—With duties at this level, imports would probably supply about the same proportion of consumption as in pre-war years. If however, there has been no post-war depression preceding this period, production for domestic market might supply as much as 3,000-5,000 tons a year. If so, and with prices 10 to 15 percent higher than in the pre-war years, imports might be from 32,000 to 40,000 tons, with a foreign value of \$675,000 to \$1,000,000, depending upon the amount of the higher priced crystalline grades imported.

Duties reduced by 50 percent.—A reduction in duties would probably reduce production for domestic market approximately 1,000 tons, valued at about \$65,000, but it is not believed that consumption of graphite in the United States would be materially changed, either in quantity or value. Imports, therefore, would amount to about 34,000-44,000 tons, with a foreign value of \$780,000-\$1,000,000.

Duties increased by 50 percent.—Production for domestic market under such rates might increase to as much as 5,000 tons, with a value of \$325,000. Imports, therefore, might amount to 30,000-40,000 tons, with a foreign value of \$625,000-\$1,000,000.

Exports

A relatively small part of the total imports of natural graphite—less than 5 percent in 1939—was refined and blended for export. In the post-war period, exports of natural graphite will continue to be made up largely of imported material, refined and blended in processing plants in the United States. At the 1939 level of national income, exports would probably be no greater than in 1939. A 75-percent increase in national income over the 1939 level might result in exports increasing as much as 50 percent.

Employment

Before the war, employment in the domestic graphite industry was small and was limited principally to refining and blending imported graphite. If domestic production of natural graphite after the war increases to as much as 6,000 tons, it may employ up to 500 persons.

ILLUMINATING GLASSWARE

Tariff paragraph: 218(c).

Commodity: Glass prisms, lamp chimneys, globes, shades, etc.

Rate of duty: 55%, 60%, or 70% ad valorem. *Equivalent ad valorem (1939):* 54%.

NOTE.—The rates shown above are those fixed in the Tariff Act of 1930. These rates were reduced, effective April 16, 1938, pursuant to the trade agreement with Czechoslovakia, but the original rates were restored on April 22, 1939, upon suspension of the trade agreement.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	11,504	473	11,031	680	11,711	Percent
Persons employed (number).....	5,000					6

¹ United States factory value.

² Landed value; foreign value was \$374,000.

³ Estimated.

Illuminating glassware includes lamp chimneys, globes, shades, and other articles such as prisms and chandeliers. It is chiefly hand-blown and hand-pressed, but some is pressed in semiautomatic and automatic machines. Illuminating glassware may be made of transparent, translucent, or colored glass, and the articles may be plain or decorated by cutting, etching, sandblasting, or painting.

United States production of this commodity amounted to about 11 million dollars in 1937 and in 1939. Imports in 1937-39 averaged about 0.5 million dollars, foreign value annually, or about 0.9 million dollars, landed value; they were equivalent to about 7½ percent of the value of consumption (the sum of United States production value plus landed value of imports).

Czechoslovakia and Germany have always been the chief sources of imports, supplying together about 90 to 95 percent of the total. After 1932 Germany's share decreased and Czechoslovakia's share increased.

During the war United States production increased, reaching an estimated 14.5 million dollars in 1941, the latest available year. Imports declined to a foreign value of \$30,000 and a landed duty-paid value of \$50,000 in 1941.

POST-WAR SHORT TERM

For several years after the war the demand for illuminating glassware might exceed that of 1939 by about 75 percent because of the estimated high building activity. The value of domestic production may be 100 percent above 1939, assuming prices about 40 percent higher than in that year.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Because of a 10 percent increase in population, the value of consumption will probably be in the neighborhood of 13 million dollars, or about 10 percent higher than in 1939, and the factory value of United States production will be about 10 percent higher than in 1939, or a little more or less than 13 million dollars, depending in part on the assumption regarding duty.

Duty as in 1939.—The landed, duty-paid value of imports probably would be about 1.2 million dollars (0.7 million dollars, foreign value), or about 9 percent of the value of consumption.

Duty reduced by 50 percent.—Imports might have a landed value of about 1.5 million dollars (1 million, foreign value) and might amount to, say, 11 percent of value of consumption.

Duty increased by 50 percent.—The landed value of imports might be about 0.9 million dollars (0.45 million, foreign value) and might be about 7 percent of value of consumption.

Per capita income 75 percent higher than in 1939.

Data for the period 1929 to 1941 indicate that the consumption value might be about 25 million dollars, or more than twice that of 1939 (assuming prices about one-third higher than in that year), and that the factory value of United States production might be about 24.6 million dollars, or more than twice that of 1939. Although the data indicate that, under constant rates of duty, the landed value of imports increases, with increasing income, at a rate somewhat faster than rate of consumption or production, imports furnish such a small percentage of total consumption that a 50 percent reduction or increase in duty probably would affect consumption or production estimates only very moderately.

Duty as in 1939.—The landed duty-paid value of imports might be about 2.8 million dollars (1.6 million, foreign value) and might account for about 11 percent of value of consumption.

Duty reduced by 50 percent.—Imports might have a landed value of about 3.6 million dollars (2.5 million, foreign value), or about 14 percent of the value of consumption.

Duty increased by 50 percent.—The landed value of imports might be only about 2 million dollars (with 1 million, foreign value), or 8 percent of the estimated value of consumption.

Exports

Exports have, in past years, been roughly proportional to production; therefore, exports might be about 0.6 million dollars if the total national income is 10 percent higher than in 1939. If the per capita income in the 1950's should be 75 percent higher than in 1939, the value of exports might be about 1.2 million dollars.

Employment

Employment might vary according to the foregoing estimates from a minimum of about 5,000 to a maximum of about 8,000 persons.

HAND-MADE GLASS PERFUME BOTTLES

Tariff paragraph: 218 (e).

Commodity: Perfume and toilet water bottles made otherwise than by automatic machine.

Rate of duty: 75% ad valorem (37½% when filled). Equivalent ad valorem (1939): 53%.

NOTE.—The 1930 Tariff Act rate (75%) was reduced to 37½%, effective from April 16, 1938, until April 22, 1939, pursuant to the Czechoslovak trade agreement which has been suspended, on unfilled bottles, and to 37½%, effective June 15, 1936, pursuant to the French trade agreement, on filled bottles.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	1,250	(¹)	1,280	450	1,700	Percent 27
Persons employed (estimated number).....	600					

¹ Estimated United States factory value.² Negligible.³ Landed value; foreign value was \$251,000.

In the 1930's, United States production of hand-made glass perfume and cologne bottles is estimated to have ranged from about 0.5–1.2 million dollars, factory value. There has, of course, been a much larger production of machine-made bottles, which are not included in this import classification.

The foreign value of imports increased from 0.3 million dollars in 1932 to 0.6 million in 1937; then declined to \$30,000 by 1941. Their landed, duty-paid value increased from about 0.5 million to 1.1 million dollars, and declined to about \$60,000.

Before 1933 France was the chief foreign supplier. However, in that year, Czechoslovakia surpassed France and retained the lead until 1939. These two countries together usually supplied 75 to 85 percent of all imports. Other important suppliers were the United Kingdom, Japan, and Germany. Imports in the 1930's supplied about 30 to 60 percent of United States consumption value (domestic production plus landed value of imports). The lower percentages correspond to those years when Czechoslovakia was not an important supplier, and 1939 is such a year.

POST-WAR SHORT TERM

In the post-war short term the consumption of hand-made perfume and toilet water bottles may be as much as 50 percent greater than in 1939, or about 2.5 million dollars because of the higher consumer income available for decorative and luxury articles. Domestic production might be as much as 1.75 million dollars unless imports from Czechoslovakia are again available in large quantities.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The total value of consumption of hand-made perfume bottles probably will exceed that of 1939 and may amount to around 2 million dollars. Assuming that Czechoslovakia again becomes an important supplier, imports probably will have a landed value of about 1 million dollars and this may supply in the neighborhood of one-half of the consumption value. Their foreign value may range from about 0.8 million dollars, if the duty is reduced 50 percent, to about 0.5 million dollars, if the duty is increased 50 percent. Domestic production may range from a little less than 1 million dollars, if the duty on imports is reduced by 50 percent, to a little more than 1 million dollars, if the duty is increased by 50 percent.

Per capita income 75 percent higher than in 1939.

Consumption might be more than double that of 1939, possibly in the neighborhood of 3.5 million dollars. Imports might have a landed value of about 1.75 million dollars or half of the total. Their foreign value might range from about 1.5 million dollars, if the duty were reduced by 50 percent, to 0.7 million, if the duty were increased 50 percent. Domestic production might be a little less than 1.75 million dollars, if the duty on imports is reduced by 50 percent, or a little more, if the duty is increased by 50 percent.

Exports

Exports will be negligible.

Employment

Employment in the United States industry in 1953 might range according to the foregoing estimates, from about 500 to 700 persons.

CHRISTMAS TREE ORNAMENTS

Tariff paragraph: 218 (f).

Commodity: Christmas tree ornaments.

Rate of duty: 60% ad valorem.

NOTE.—The above rate is that fixed in the Tariff Act of 1930. Pursuant to the trade agreement with Czechoslovakia, effective from April 16, 1938, to April 21, 1939, inclusive, and which has been suspended, the rate of duty on Christmas tree ornaments was reduced to 50 percent.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	1 200	None	1 200	1 372	1 572	Percent 87
Persons employed (number).....	1 50					

¹ Estimated.

² Landed value; foreign value was \$784,000.

Glass Christmas tree ornaments are thin blown glass articles produced in many shapes and colors. Most generally they are round and decorated in solid colors. They are inexpensive, heretofore largely produced by hand labor in foreign countries. In the past, labor has constituted a large proportion of the total cost of the foreign product.

Before World War II about 90 percent of the Christmas tree ornaments consumed in the United States were supplied by imports from Germany, Japan, Czechoslovakia, and Poland. When these countries because of war conditions were no longer able to supply the United States market with ornaments, several domestic producers began to manufacture them. One manufacturer, by mass production methods, produced this article at the rate of several hundred a minute on the same continuous ribbon machine that produced electric light bulbs. So far, ornaments produced by this machine have been restricted to a comparatively few shapes and decorations. Domestic manufacture was discontinued in 1943 because of the nonessential character of this product. Data on domestic production are not available, but domestic production probably supplied a substantial part of the amount consumed in the United States during the early years of the war.

Since glass Christmas tree ornaments are used principally for decorations, the domestic demand follows closely the per capita income of the United States.

POST-WAR SHORT TERM

Because of the deferred demand the annual consumption of Christmas tree ornaments for several years after the war may amount to as much as \$2,750,000, or 75 percent more than was consumed in this country in 1939. Domestic manufacturers will probably supply a large part of United States requirements.

POST-WAR LONG TERM

Consumption, Production, and Imports

The demand for glass Christmas tree ornaments may still be large during the early 1950's. Although other forms of decoration, such as incandescent electric lamps, wreaths, and tinsel, are likely to be widely used, the glass ornaments will undoubtedly continue to retain their popularity. With machine production in this country, the price of ornaments may decline, thus encouraging increased use. There is a possibility that as plastics are further developed, ways may be devised to use them in place of glass for ornaments, but, so far, few plastic ornaments have been sold. Glass is cheaper than plastics and will probably continue to be used.

Per capita income at 1939 level.

The value of glass Christmas tree ornaments consumed annually during the early 1950's may not be so high as in the immediate post-war period but may amount to 2 million dollars, about 25 percent more than in 1939. Domestic production may supply most of the demand except for certain shapes and color styles which are not consumed in sufficient quantities in this country to warrant their production.

Duty as in 1939.—Imports might have a foreign value of \$230,000 and a landed value of about \$400,000 and thus supply about 20 percent

of consumption. Domestic production would then amount to about 1.6 million dollars.

Duty reduced by 50 percent.—Imports might have a foreign value of about \$340,000 and a landed value of about \$500,000 and thus supply about 25 percent of consumption. Domestic production would then amount to about 1.5 million dollars.

Duty increased by 50 percent.—Imports might have a foreign value of \$170,000 and a landed value of about \$350,000 and thus supply about 17 percent of consumption. Domestic production would then amount to about 1.7 million dollars.

Per capita income 75 percent higher than in 1939.

With a substantial increase in the national income, United States consumption of this article of decoration might reach a value of 3 million dollars, or approximately twice the value of the 1939 consumption. Imports under these conditions would be expected to represent the same percentages of consumption as under the lower income level.

Duty as in 1939.—Imports might have a foreign value of \$340,000 and a landed value of about \$600,000 and thus supply about 20 percent of consumption. Domestic production would then amount to about 2.4 million dollars.

Duty reduced by 50 percent.—Imports might have a foreign value of \$500,000 and a landed value of about \$725,000 and thus supply about 25 percent of consumption. Domestic production would then amount to about 2¼ million dollars.

Duty increased by 50 percent.—Imports might have a foreign value of \$250,000 and a landed value of about \$500,000 and thus supply about 17 percent of consumption. Domestic production would then amount to about 2.5 million dollars.

Employment

The estimated number of workers employed in the glass Christmas tree ornament industry in the United States was about 50 in 1939. With a high national income and a domestic production valued at 2.5–3.0 million dollars the industry might give employment to about 350 workers.

HAND-MADE GLASSWARE

Tariff paragraph: 218 (f), (g).

Commodity: Hand-made glass table and decorative ware.

Rate of duty: 30% to 60%.

Equivalent ad valorem (1939): 57%.

NOTE.—The Tariff Act of 1930 imposed the rate of 50% ad valorem on pressed and unpollished ware and 60% ad valorem on the other articles in this group. The rate on engraved articles valued at not less than \$5 each was reduced from 60% to 30% under the trade agreement with Sweden, effective August 5, 1935. The rates on the other articles in the group were reduced, from April 10, 1938, to April 21, 1939, under the trade agreement with Czechoslovakia, which has been suspended. The rate on cut or engraved articles valued at not less than \$1 each, other than those covered by the agreement with Sweden, was reduced to 45% under the agreement with the United Kingdom, effective January 1, 1939. The rate on bubble glassware was reduced from 60% to 30% pursuant to the trade agreement with Mexico, effective January 30, 1943.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 dozen pieces).....	8,300	(¹)	8,300	(¹)	(¹)	<i>Percent</i>
Value (\$1,000).....	\$ 11,655	\$ 73	11,580	\$ 2,720	14,300	19
Unit value (per dozen).....	\$1.40		\$1.40			
Persons employed (number).....	6,000					

- ¹ Not available.
- ² United States factory value.
- ³ July-December.
- ⁴ Landed value; foreign value was \$1,537,000.

Hand-made glassware includes hand-blown and hand-pressed tumblers, goblets, bar ware, plates, cups, saucers, dishes, bowls, vases, figures, ashtrays, and so forth. Most of the imports are hand-blown ware, whereas production is about equally divided between hand-blown, and hand-pressed ware.

United States production of this commodity in the late 1930's ranged from less than 11 to more than 13 million dollars (factory value). Imports ranged from 1.3 to 3 million dollars (foreign value); their landed duty-paid value was 2.3 to 5.4 million dollars, or about 15 to 30 percent of the sum of United States production value plus landed value of imports (hereafter called consumption value). From 1935 through 1938 the value of domestic consumption averaged about 16 million dollars per year, factory value of domestic production about 12 million, and the landed duty-paid value of imports about 4 million, or 25 percent of the value of consumption. It appears, therefore, that 1939 was not a representative pre-war year.

Total imports, and particularly those from Czechoslovakia and Japan, the principal sources of low-priced imports, increased from 1935 to 1937, both in value and in ratio to total United States imports. From 1938 through 1941 imports as a whole, and especially those from Czechoslovakia and Japan, declined markedly. After 1941 imports, except in reduced amounts from the United Kingdom and Sweden, practically ceased.

Because of an increase in United States demand and the decline in imports, domestic production increased in value from less than 12

million dollars in 1939 to more than 19 million in 1941, the latest available estimate. This increase was possible without expansion of the capacity of the industry because much of the existing capacity was not previously in use.

Methods of production are much the same in the several producing countries and the high proportion of hand work required gives competitive advantage to countries with low wage levels.

POST-WAR SHORT TERM

In the post-war short term the consumption of hand-made glassware, owing in part to deferred demand, may be 50-75 percent greater than in 1939. The volume of possible sales may exceed the present domestic production capacity plus available imports, if, as is assumed, imports from Japan and Germany should be negligible. The domestic industry, moreover, might not expand its capacity to meet the potential market unless there were considerable assurance that demand would continue at a high level. Imports would probably come chiefly from Czechoslovakia, if production in that country should be revived immediately after the war, and from the United Kingdom, Sweden, and other European countries. Though reduced in volume because of high prices, imports might have a higher total value than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

It is assumed that, as in 1935-41, sales of hand-made glassware will follow the trend of national income with, however, a slight lag. In the discussion which follows, the estimated consumption values and the indicated ratios of imports to consumption may seem large compared with 1939. However, for reasons stated, the value of imports in 1939 was only about 60 percent, and the value of consumption, consequently, was only about 85 percent, of what might have been expected with the national income of that year.

Per capita income at 1939 level.

Duty as in 1939.—The total value of consumption of hand-made glassware might amount to about 17 million dollars, or 120 percent of 1939 consumption, assuming prices to be about the same as in 1939. Imports might supply as much as, say, one-fourth of the value of consumption, or possibly 4.3 million dollars landed, duty-paid value (2.4 million dollars, foreign value); probable domestic production would then be a little less than 13 million dollars.

Duty reduced by 50 percent.—A reduction in price of imported ware following the reduction in duty, might increase consumption to nearly 18 million dollars. Imports might supply as much as, say, one-third of the value of consumption, or roughly 6 million dollars landed value (equivalent to 4 million dollars, foreign value); and domestic production would then be about 12 million dollars.

Duty increased by 50 percent.—If prices of imports are increased, consumption might decline to possibly 16 million dollars. Imports would be considerably less important than at the 1939 duty and might not supply more than, say, one-sixth of the value of total domestic consumption, or about 2.7 million dollars (1.3 million dollars, foreign value); and the probable domestic production would then be somewhat more than 13 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of hand-made glassware, in view of its past trend relative to national income, might amount to about 25 million dollars, or about 175 percent of the 1939 consumption. During 1934-37, with growing national income, imports increased at a considerably faster rate than domestic production did, partly because there was a greater increase in demand for hand-blown ware (the principal type imported) than for hand-pressed ware. With higher income, there is apparently a considerably greater increase in demand for hand-blown table glassware such as goblets, wine glasses, etc., than for hand-pressed glass articles such as bowls, figurines, and ash trays. It is assumed that after the immediate post-war reconstruction period this trend will continue unless import duties are altered appreciably. It is also assumed that prices will be about 25 percent above those of 1939.

Duty as in 1939.—Assuming a consumption value of 25 million dollars, imports might account for about 30 percent, or 7.5 million dollars, landed, duty-paid value (their foreign value might be about 4.3 million dollars). Under these conditions domestic production should be about 17.5 million dollars.

Duty reduced by 50 percent.—Reduced prices of imports might increase consumption to, say, 26 million dollars. Imports might amount to possibly 10 million dollars landed value, or something over 35 percent of the value of consumption (their foreign value might be 6.7 million dollars). If so, production might be in the neighborhood of 16 million dollars.

Duty increased by 50 percent.—If prices of imported ware increase, consumption might be reduced to possibly 24 million dollars. Imports might be about 20 percent of consumption, or 4.8 million dollars landed value (the foreign value might be about 2.3 million dollars), United States production would then be about 19 million dollars, factory value. Should the volume of possible sales of domestically produced ware exceed, in the long term, the present capacity of the United States industry, the industry would undoubtedly expand its capacity to meet the demand.

Employment

Employment in this United States industry in 1953 might vary, according to the foregoing estimates, from about 5,000 to 10,000 employees.

SHEET GLASS

Tariff paragraph: 219.

Commodity: Cylinder,¹ crown,¹ and sheet glass.

Rate of duty: 1³/₄ to 2⁵/₈¢ lb. Equivalent ad valorem (1939): 60%.
(depending on the superficial area).²

NOTE.—The Tariff Act of 1930 imposed rates ranging from 1³/₄ to 3³/₄ cents per pound, depending on superficial area with a minimum rate of 50 percent ad valorem on glass weighing less than 16 but not less than 12 ounces per square foot. The rates were reduced one-fourth by proclamation of the President, effective January 1, 1932, under section 236 of the tariff act. The rates were further reduced during the period April 16, 1938, to April 21, 1939, pursuant to the trade agreement with Czechoslovakia, which has been suspended.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	550,868	730	550,138	26,584	576,722	Percent 4.6
Value (\$1,000).....	24,326	70	24,256	1,635		
Unit value (per pound).....	\$0.044	\$0.095	\$0.044	\$0.024		
Persons employed (number).....	5,000-6,000					

¹ Foreign value.

Sheet glass, commonly known as window glass, is the type of glass generally used for glazing dwelling-house windows, factory skylights, conservatories, and greenhouses. It is also used for picture frames, in small mirrors, for watch crystals, and to some extent in the manufacture of safety glass for automobiles and airplanes.

The great bulk of the world's sheet glass has been produced in a few countries—the United States, Belgium, Czechoslovakia, the Soviet Union, Japan, Germany, the United Kingdom, and France. Exports from these eight countries, which averaged about one-half billion pounds annually during the decade before World War II, comprised virtually the total international trade in sheet glass.

World capacity is estimated at between 5 and 6 billion pounds annually. About one-fifth of this capacity is in the United States, which leads in production. Three companies account for over 75 percent of the total United States output. In all producing countries, productive capacity in most years exceeds actual production by a wide margin. In 1939, domestic production amounted to only about 50 percent of the domestic productive capacity.

Consumption of sheet glass in the United States depends to a large extent upon the amount of building construction. During the 10 years preceding the present war, consumption fluctuated from a low of about 300 million pounds in 1932 and 1933 to a high of nearly 800 million pounds in 1937. The largest consumption, nearly 900 million pounds, was reached in 1941 partly because of purchases by the Government for construction of barracks, cantonments, and temporary housing units.

¹ The terms "cylinder" and "crown" refer to obsolete methods of producing this type of glass.

² Glass weighing less than 16 ounces but not less than 12 ounces per square foot is subject to a minimum rate of 37¹/₂ percent ad valorem.

Formerly, imports of sheet glass came principally from Belgium, Czechoslovakia, and Germany, but they have practically ceased during the war. In the 1920's, when building activity was high and United States industries were shifting from hand methods to machine methods of production, imports supplied on the average 10 percent of the amount consumed. During the 1930's, when building activity was low and domestic industries were fully mechanized, they averaged less than 5 percent of the amount consumed under varying rates of duty.

A large part of the world production and an even larger part of the world trade in sheet glass in recent pre-war years was controlled by six interrelated companies—two in the United States, two in Belgium, one in France, and one in England. This control may have been more effective than customs tariffs in restricting world trade.

POST-WAR SHORT TERM

Civilian demand for building materials of all kinds, so long deferred, may reach a record height after the war. The building deficit plus a presumably high national income in the immediate post-war years should cause great activity in building construction and, in general, in repairs and remodeling of buildings. Automobile production will probably be resumed on a large scale. Under these conditions United States consumption of sheet glass may amount to as much as 800–900 million pounds (35–40 million dollars at 1943 prices)³ a year, or about 50 percent more than consumption in 1939.

It is difficult to estimate United States imports of sheet glass during the immediate post-war period. Conditions of production in Europe (especially in Belgium and Czechoslovakia) and conditions of demand in Europe will be major factors affecting imports. Within 2 or 3 years after the war European producers of sheet glass may not have rehabilitated their industries sufficiently to permit them to satisfy urgent local demands and at the same time to export to the United States much larger quantities, if as large, as they did in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The principal conditions affecting domestic consumption of sheet glass in the post-war long term (1953) will be the state of the United States building and automobile industries at that time and the growth of new uses of sheet glass such as double glazing of windows. A large part of the huge demand accumulated during the war for sheet glass for building construction and for automobiles will probably be satisfied by 1953, but it may be 8 or 10 years after the war before the deferred demand is completely met. As building construction in the United States will probably still be fairly active in 1953, and as double glazing of windows in homes will likely have become more general, consumption of sheet glass in this country at that time, even at the low level of national income here assumed, may amount to 700–900 million pounds a year (30–40 million dollars at

³ Prices were the same in 1939 as in 1943.

1939 price levels). Consumption in the United States of sheet glass in the post-war long term would probably not be materially affected by a 50-percent decrease or a 50-percent increase in tariff rates.

By 1953 the rehabilitation (and possibly the expansion) of the European sheet-glass industry will probably have been completed. If by that time the abnormal post-war demand in Europe should have begun to subside and if, as seems probable, exports to Latin America should have become greatly reduced by reason of the development of sheet-glass industries in some Latin American countries, European producers might desire to obtain an increased outlet in the United States. Their ability to do so would depend upon their competitive position in this market, which, in turn, would depend upon such unpredictable factors as comparative wage rates, comparative currency values, the height of the United States tariff on sheet glass, the existence or nonexistence of cartel arrangements, and the character of any cartel arrangements that may be in effect. Unless factors of this kind should be markedly more unfavorable to the domestic industry than in the immediate pre-war period, imports in the post-war long term are not likely to form much, if any, larger percentage of United States consumption than they did in 1939.

Duty as in 1939.—Imports will probably form about the same percentage of the amount consumed as in 1939, say, 4 to 5 percent. If this should prove true and if United States consumption should be 700-900 million pounds, then imports would amount to 30-45 million pounds with a foreign value of \$720,000-\$1,000,000.

Domestic production then would range from 655 million pounds (minimum consumption with maximum imports) to a high of 870 million pounds (maximum consumption with minimum imports), valued at 29 to 38 million dollars.

Duty reduced by 50 percent.—If European building has caught up with the deficiency and United States building is active, imports may supply as much as 6-7 percent of United States needs, or 40-65 million pounds (1.0-1.5 million dollars, foreign value). Domestic production would range from 635 million pounds (minimum consumption with maximum imports) to 860 million (maximum consumption with minimum imports), valued at 28-38 million dollars. If, on the other hand, European building is still very active in 1953 and United States building has receded, a reduction in duty would probably not result in much, if any, larger imports than in 1939.

Duty increased by 50 percent.—It is quite likely that this increase (which would result in a duty equivalent to about 90 percent ad valorem on the basis of 1939 prices) would cause a drop in imports of glass into the United States to about 10-15 million pounds a year (\$240,000-\$360,000 foreign value).

Per capita income 75 percent higher than in 1939.

With a 75-percent greater national income in the United States domestic building construction would probably be very active, more repairs and replacements would be made, automobile production would be high (possibly at the rate of 6-7 million cars a year) and there would be a greater use of sheet glass in other industries. Under such conditions, the consumption of sheet glass in the United States in 1953 might easily reach 1¼ billion pounds a year.

Duty as in 1939.—With a huge demand for sheet glass in the United States at prices somewhat above the 1939 level and with

building in Europe past its peak, United States imports might amount to as much as 4-5 percent of United States consumption or 50.0-62.5 million pounds a year (1.4-1.8 million dollars). Domestic production under these conditions would be around 1.2 billion pounds, valued at about 60 million dollars.

Duty reduced by 50 percent.—With a 50-percent reduction in duty and so large a volume of demand in the United States, imports might supply 6-7 percent of United States consumption, or 75.0-87.5 million pounds with a foreign value of 2.0-2.4 million dollars. Domestic production under these conditions would be slightly less than 1.2 billion pounds (about 60 million dollars).

Duty increased by 50 percent.—Notwithstanding a high national income and active demand for sheet glass in the United States, if duties were increased 50 percent, it is doubtful whether imports would be much, if any, larger than they were in 1939, or about 25-30 million pounds, having a foreign value of \$690,000-\$830,000. Domestic production under these conditions would be slightly more than 1.2 billion pounds (over 60 million dollars).

Exports

Except during World Wars I and II, United States exports of sheet glass have been small compared with domestic production or with imports; they have seldom exceeded 1 million pounds a year, less than 1 percent of production. In 1943, however, United States exports amounted to more than 53 million pounds. The domestic industry has usually been unable to compete abroad with European and Japanese producers. In the immediate post-war period, however, United States exports will probably be considerably greater than in 1939 because foreign producers are not likely to have a surplus for export. In the long-term period when European producers will again be competing actively in foreign markets, United States exports will probably decline to the pre-war level, or to less than 1 million pounds a year. Several South American markets, to which the United States formerly exported sheet glass, are likely to be self-sufficient in this product by that time.

Employment

There has been a steady increase in man-hour output in the sheet-glass industry over a period of years. If this increase continues, employment will not increase in proportion to domestic production. It is likely that in the long-term period, with a production of almost 1½ billion pounds a year, the industry would give employment to about 10,000 workmen.

PLATE GLASS

Tariff paragraph: 222 (a).

Commodity: Plate glass.

Rate of duty: 8%^{of} to 13%^{of} per sq. ft. *Equivalent ad valorem (1939): 58%.*
 (depending on the superficial area); a minimum rate of 50% is provided for plate glass measuring $\frac{1}{4}$ in. or over in thickness.

NOTE.—The Tariff Act of 1930 imposed rates ranging from 12 $\frac{1}{4}$ to 19 $\frac{1}{4}$ cents per square foot, depending on superficial area, with a minimum rate of 50% ad valorem on glass measuring one-half inch or over in thickness. The specific rates were reduced to those shown above pursuant to the trade agreement with Belgium, effective May 1, 1935.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 square feet).....	141,471	3,639	137,832	315	138,147	Percent 0.2
Value (\$1,000).....	42,441	1,106	41,335	171		
Unit value (per square foot).....	\$0.30	\$0.304	\$0.30	\$0.225		
Persons employed (number).....	5,000-5,000					

† Estimated.

‡ Foreign value.

Plate glass differs from sheet (window) glass and rolled glass in that it has been wholly ground and polished on both surfaces. Grinding and polishing make the surfaces perfectly flat, parallel, and highly brilliant. This glass is produced in thicknesses ranging from $\frac{1}{4}$ inches, used only in small quantities for limited uses, to $\frac{3}{4}$ inch, used extensively for making laminated safety glass. Before the war, about 75 percent of the plate glass produced in this country was used in automobiles, about 15 percent in buildings, and the other 10 percent in mirrors and in other uses. During the war much plate glass has been consumed for the manufacture of bulletproof glass, for use in bombers and other military equipment, and wherever possible, as a substitute for optical glass.

Before the war the United States regularly produced more plate glass than all the European countries combined. Belgium was the largest European producer, followed by Germany. United States imports, which came principally from Belgium, were significant only during the 1920's. Disadvantages in competition in addition to the duties and costs of transportation have prevented the Belgian plate glass manufacturers from giving the United States industry any serious import competition in recent pre-war years. The domestic manufacturers of plate glass are geographically placed where they can advantageously serve the automobile manufacturers, with whom it would appear that they have had contractual relations of long standing. There is no evidence, however, that they have any such ad-

vantage in supplying the plate-glass demands of the construction, furniture, or mirror industries. Two of the three dominant American manufacturers—who control over 90 percent of this country's production—have been closely affiliated with producers of plate and window glass in Europe.

POST-WAR SHORT TERM

In the first few years after the war, the deferred civilian demand for automobiles, buildings, furniture, and mirrors is likely to increase domestic consumption to 180-200 million square feet. Although the Belgian and other foreign producers may want to export plate glass to the United States so as to obtain dollar credits, their most likely immediate post-war markets may be the devastated cities of Europe. It seems unlikely, therefore, that they will send any significant quantities to the United States, regardless of the height of the United States duty.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The pre-war rising trend in plate glass consumption will likely continue during the next decade or longer. When during the early 1950's our population will have increased about 10 percent over what it was in 1939, the demand for plate glass in the automobile, construction, furniture, and other industries will doubtless maintain domestic consumption at about 200 million square feet, valued at about 60 million dollars, even if national income is no higher than it was in 1939. By that time the foreign manufacturers of plate glass may have caught up with their deferred post-war European orders, and may again have some glass for export markets. It does not seem likely that a 50-percent increase or decrease in duty would materially change the volume of consumption.

Duty as in 1939.—For the various reasons enumerated, the existing duties on plate glass may not have any great influence on our import trade during the 1950's. Temporary spurts in demand for imported plate glass in domestic markets close to the seaboard may, under present duties, cause sporadic increases in foreign shipments, but it does not seem very likely that the total in any year will exceed 600,000 square feet, with a foreign value of about \$135,000, assuming foreign prices to be about at the 1939 level.

Duty reduced by 50 percent.—Despite the difficulties of European producers in selling any great amount of plate glass to the United States, they might be able to increase appreciably their exports to this country if the duties were reduced by 50 percent. With the lower duties, imports might increase in the long-term post-war period to as much as 1½ million square feet, having a foreign value of about \$300,000.

Duty increased by 50 percent.—It seems likely that a 50-percent increase in the duties on plate glass would practically eliminate all imports except special grades and sizes not produced by the domestic industry. These imported specialties would probably not amount to much more than, say, 300,000 square feet, and have a foreign value

of perhaps around \$100,000, even with a total domestic consumption of as much as 200 million square feet.

Per capita income 75 percent higher than in 1939.

If the normal upward trend in consumption of plate glass were further augmented by a 75-percent increase in the national income, the United States might consume as much as, say, 250 million square feet, having a value of about 85 million dollars, assuming prices about 10 percent higher than in 1939, and regardless of whether duties remain the same as in 1939 or whether they are reduced or increased by 50 percent.

Duty as in 1939.—Imports would probably not increase to more than a million square feet, with a foreign value of something over \$225,000. Although there is the possibility that an unusual temporary upsurge in demand in some seaboard areas might raise the quantity and value of imports somewhat above this figure in a particular year.

Duty reduced by 50 percent.—It is extremely difficult to estimate the probable increase in imports of plate glass, if the duties were to be reduced by 50 percent during the period when the United States will be enjoying a greatly increased national income. In this situation there might very well be a materially increased demand for foreign plate glass, especially along the Atlantic and Pacific seaboards. Imports of plate glass might amount in an average year in the post-war long term to as much as 5 million square feet, or about 2 percent of the amount consumed, and the foreign value of such imports might be as great as 1¼ million dollars, and, in case of an unusual temporary upsurge in demand in some seaboard areas, to as much as 10 million square feet, or about 4 percent of the amount consumed, having a foreign value of about 2.5 million dollars, in a particular year.

Duty increased by 50 percent.—If the duty on plate glass were to be increased by 50 percent, even though the United States were enjoying a high level of national income, importation would probably be limited largely to specialties and special shipments to meet emergency needs which in the aggregate would probably not exceed 500,000 square feet, having a foreign value of about \$200,000.

Exports

During the immediate post-war period, the United States plate-glass manufacturers may be able to export their product in substantial quantities. After the European plate-glass industry has been revived, however, they will probably not be able to export much, if any, larger quantities of plate glass than they did during the 1930's; i. e., about 4 million square feet a year.

Employment

With the increasing mechanization of the plate-glass industry, the number of workers per unit of product has declined markedly. In 1939 from 5,000 to 6,000 workers were employed in the domestic industry. This number will probably be but relatively little increased after the war even though production expands materially. With a production of 200–250 million square feet the domestic industry might give employment to 7,000–8,000 workers.

LENSES OF GLASS

Tariff paragraph: 226.

Commodity: Optical and ophthalmic lenses of glass.

Rates of duty: Lenses with edges unground, 25% or 40% ad val.
 Lenses with edges ground or beveled, 10¢ per dozen pairs and 35% ad val. } *Equivalent ad valorem (1939): 35%.*

NOTE.—Rates fixed in the Tariff Act of 1930 were 40% ad valorem on lenses with edges unground and 10¢ per dozen pairs + 35% ad valorem on lenses with edges ground or beveled. The rate on spectacle and eyeglass lenses (including plano or coquille glasses) with edges unground and valued at \$10 or more per dozen pairs was reduced to 25% ad valorem, effective January 1, 1939, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	1 14, 258	1 258	1 14, 000	1 380	14, 330	<i>Percent</i> 2. 6
Persons employed (number).....	1 2, 000					

1 Estimated.
 2 Includes some photographic and projection lenses.
 3 Landed value; foreign value was \$254, 000.

Lenses of glass are made of optical glass (par. 227), which is treated in a separate section. Glass lenses can be classified for convenience as "ophthalmic" and "optical." Ophthalmic lenses or those used in spectacles and eyeglasses range from the inexpensive colored or tinted lenses used in sunglasses and goggles to the more expensive multi-vision (bifocal or trifocal) lenses used in spectacles to correct defective vision. Optical lenses are those used in such high-precision instruments as telescopes, binoculars, microscopes, and range finders.

Although use of optical instruments in research and industry has been steadily increasing—and should continue to increase—lenses for optical instruments accounted for only 10 to 15 percent of United States consumption of all lenses before the war. The demand for ophthalmic lenses has also shown a steady upward trend, which will probably continue. The industry, however, has so materially enlarged its plants during the war for vital military and increased civilian requirements that it may have more than enough capacity to meet the country's post-war needs for some years to come.

Before the war two large- and a number of medium-sized and small concerns produced glass lenses in the United States. The two large firms produced over 50 percent of the total output. One of these firms manufactured both kinds of lenses, ophthalmic and instrument, largely for its own use in the production of spectacles and optical instruments. The other produced only ophthalmic lenses for sale as such or in the form of spectacles.

Imports of glass lenses before the war came principally from Germany, the United Kingdom, and Japan. Imports from Japan consisted chiefly of spectacle lenses.

Lenses made of plastics are less brittle, but more easily scratched, than glass lenses. Although glass is cheaper than most plastic materials, some lenses made of plastics may eventually be as cheap and as serviceable as comparable glass lenses. It is doubtful, however, whether plastic lenses will supplant many glass lenses for most purposes.

POST-WAR SHORT TERM

Returned military equipment in which optical lenses have been incorporated and the optical instrument lenses made and being processed will doubtless meet a large part of military requirements for several years. The deferred demand for optical glass needed for educational and industrial instruments will probably not be sufficient during the immediate post-war period to employ the capacity freed by reduced military production.

Stocks of spectacle lenses have been greatly reduced during the war and consequently the demand for them will probably be much increased. United States consumption of these lenses may perhaps be 50 percent more than in 1939. It seems likely that the domestic industry will supply practically all domestic needs.

POST-WAR LONG TERM

Consumption, Production, and Imports

There will probably be a larger consumption of instrument lenses during the early 1950's than in 1939, especially if the United States should maintain a larger military force after than before the war. Increased consumption of ophthalmic lenses for spectacles also can probably be anticipated. The domestic industry will probably continue to supply practically all domestic needs.

Per capita income at the 1939 level.

The value of consumption of optical and ophthalmic lenses will probably not exceed 20 million dollars, if per capita national income during the early 1950's is no higher than it was in 1939.

Duty as in 1939.—Imports might amount to about \$200,000 (foreign value).

Duty reduced by 50 percent.—Imports might amount to about \$400,000 (foreign value).

Duty increased by 50 percent.—Imports would probably consist almost exclusively of specialties and might amount to about \$100,000 or less (foreign value).

Per capita income 75 percent higher than in 1939.

Consumption might amount to as much as 30 million dollars.

Duty as in 1939.—Imports might then amount to as much as \$300,000 (foreign value).

Duty reduced by 50 percent.—Imports might amount to about \$600,000 (foreign value).

Duty increased by 50 percent.—Imports might amount to about \$150,000 (foreign value).

Exports

The value of United States exports of lenses prior to 1939 was about equal to the foreign value of imports. The domestic industry, however, has expanded its activities during the war to such an extent that it is now not only meeting its own civilian and military requirements but is exporting lenses to markets formerly supplied by Germany and Japan. How soon, if ever, Germany and Japan can recapture these export markets cannot be predicted.

Employment

The estimated number of workers employed in 1939 in the lens industry in the United States was about 2,000. With a 75-percent increase in national income the industry might give employment to about 4,000 workers.

OPTICAL GLASS

Tariff paragraph: 227.
Commodity: Optical glass.
Rate of duty: 50% ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 3, 600	(?)	1 3, 600	288	1 3, 888	Percent 7.4
Value (\$1,000).....	2, 279	(0)	2, 279	1 285		
Unit value (per pound).....	\$0. 63	(?)	\$0. 63	\$0. 99		
Persons employed (estimated number).....	200					

1 Estimated.
0 Negligible.
? Foreign value.

The statistical data given above and the statement following refer to domestic production, imports, and exports of optical glass, as such. (For information on lenses, prisms, and other advanced articles made from the material, see statements on lenses and optical instruments.)

Optical glass is a clear glass which must meet precise specifications as to chemical composition, homogeneity, and freedom from physical defects. In some uses, however, the material need not meet as exacting specifications as in others. As a result, optical glass may be divided into two main categories: (1) *instrument glass* suitable for lenses or prisms in optical instruments; and (2) *ophthalmic glass* for use in spectacles. The latter is not subject to as rigid specifications as instrument glass and is manufactured in a manner similar to plate glass. Instrument glass is produced by special processes in small batches, from which frequently 'only small parts are recovered as usable material.

The demand for instrument glass for microscopes, binoculars, photographic lenses, and other instruments used in educational research

and medicine and in industry has long been increasing. Before the present war, however, this glass accounted for only 5 to 10 percent of United States consumption of optical glass. The demand for ophthalmic glass has also shown a long upward trend. It will probably continue to increase substantially and considerably more than otherwise if a high level of national income encourages people to seek more optical attention. A similar trend and relation to the level of national income is likely to be shown in the consumption of instrument glass because of expanding educational and industrial research.

There was some production in this country of ophthalmic glass before World War I. Production of instrument glass in the United States began when the National Bureau of Standards erected a pilot plant to develop formulas and processes. With the encouragement thus provided, a few private concerns undertook to make instrument glass. After that war the Bureau of Standards continued to make small quantities, but only two private concerns continued in the business. One of these later ceased making instrument glass but continued to make ophthalmic glass; the other continued to produce both types.

Before World War II about half the United States consumption of instrument glass was imported from Germany, the United Kingdom, and France. In the early war years small amounts of such glass were imported from the United Kingdom and Canada for use in the production of instruments, some of which were exported. Because instrument glass is essential for the production of much military equipment, it is designated as a critical material, and, with our expanded armament program, it was required in greatly increased quantities. Several domestic companies were encouraged to undertake its production.

In the inter-war period domestic production of ophthalmic glass supplied about 95 percent of the amount consumed; imports from Japan, Germany, the United Kingdom, and France supplied only about 5 percent. During the war there has developed a considerable military requirement for this type as well as for instrument glass since many men in the armed forces with impaired vision are being fitted with spectacles.

The present United States facilities are considered adequate to fill military and civilian requirements for both instrument and ophthalmic glass and it is unlikely that peacetime consumption will be as large as the amount these facilities are capable of supplying.

The use of plastic materials for lenses and prisms has been considered for some time. These materials offer advantages, principally because they are less brittle and possibly can be cheaply molded into the final forms; glass lenses are made by grinding and polishing. A disadvantage of plastic optics so far developed is that they are more easily scratched. Some plastic parts are in use in the armed services but the following analysis of the outlook for the future of optical glass is based on the assumption that plastics will not be greatly used. It is, however, by no means certain that this assumption will prove to be correct.

Another principal uncertainty with respect to the future trade in optical glass arises from the fact that Germany and Japan were important sources of imports. Germany, especially, was the principal source of imports of instrument glass. Thus developments in future import trade may be closely related to the program of the United Nations with respect to the economy of enemy countries. There is a possibility that

Germany and Japan may not be in a position for some time to supply optical glass for export and it is likely that the industry of no foreign country other than Germany will quickly, if ever, attain as dominant a position in optical glass and lenses as Germany formerly occupied. It is quite possible, therefore, that United States industry will in the future supply the bulk of domestic consumption both of ophthalmic and instrument glass with only small imports of certain specialties which are not consumed in sufficient quantities in this country to warrant their production here. On the other hand, the production of instrument glass is not a major interest of most of the concerns now engaged in the business, and it is probable that a large part of the present facilities will cease to be operated when needs are less urgent. A substantial production of optical glass has been developed in Canada during the war, and it is probable that the United Kingdom and France will have productive capacity in excess of their requirements.

POST-WAR SHORT TERM

Following the war, military demands for optical instrument glass will diminish. The return to this country of equipment in which optical glass has been incorporated and the optical instrument glass already made and being processed will for several years doubtless meet a large portion of military requirements. The deferred demand, however, for educational and industrial instruments in which optical instrument glass is an important part will likely be considerable and the consumption of optical instrument glass, therefore, will probably remain at about 250,000 pounds, or the same as it was in 1939.

United States stocks of spectacle lenses have been greatly reduced during the war and consequently the demand for ophthalmic glass will probably be much increased. Annual consumption of such glass, therefore, may amount to as much as 5 million pounds (worth probably 2.5 million dollars at 1943 prices) a year, around 50 percent more than was consumed in this country in 1939. It seems likely that the domestic industry will supply practically the entire consumption of ophthalmic glass and probably also a greater percentage than before the war of the domestic consumption of instrument glass.

POST-WAR LONG TERM

Consumption, Production, and Imports

Large consumption of instrument glass is especially to be anticipated if the country should maintain a larger military force after than before the war. The maintenance of such forces would involve a large demand for the newest and most improved fire-control and other precision instruments. The consumption of optical glass is not greatly affected by price changes because the price of the glass accounts for only a minor part of the value of the finished lenses and other finished forms and still less of the value of the products in which the optical glass is incorporated. Thus, the level of the duties on imports would have little if any effect on the volume of consumption. Domestic production would likely supply not less than the same proportion of this total than in 1939 and might supply practically all of the amount consumed. The most reasonable guess would seem that, under the same rates of duty as prevailed in 1939, imports would supply about

half as much as they did in 1939, say, 4 percent of total consumption. Probably the influence of the different rates of duty to be considered under Senate Resolution 341 is such that 6 percent of consumption might be supplied under the lower rate of duty, compared with 2 percent under the higher rate. The effects of variations of imports that might result from different levels of duty on the volume of domestic production would not be appreciable in relation to the margin of error involved in any estimate of future consumption.

Per capita income at the 1939 level.

Consumption might amount to about 5.5 million pounds, or approximately 40 percent more than it was in 1939.

Duty as in 1939.—Imports might amount to 4 percent of consumption or about 220,000 pounds. Since it is probable these imports would consist largely of specialties, and have a somewhat higher unit value than the imports in 1939, their total foreign value would be about \$250,000. Domestic production would then be about 5.3 million pounds with a value of about 3.3 million dollars.

Duty reduced by 50 percent.—Imports would probably be 6 percent of consumption or about 330,000 pounds with a foreign value of about \$350,000. Domestic production would then be about 5.2 million pounds with a value of about 3.2 million dollars.

Duty increased by 50 percent.—Imports under these circumstances would probably consist almost exclusively of specialties and might amount to 2 percent of consumption, or about 110,000 pounds, having a foreign value of, say, \$165,000. Domestic production would then be about 5.4 million pounds with a value of about 3.4 million dollars.

Per capita income 75 percent higher than in 1939.

If the normal upward trend in optical-glass consumption were further augmented by a material increase in the national income, the United States might easily consume nearly 8 million pounds of optical glass annually, or approximately 100 percent more than in 1939.

Duty as in 1939.—Imports might then amount to 4 percent of consumption, or about 320,000 pounds, with a foreign value of about \$375,000. Domestic production would then be about 7.7 million pounds, with a value of about 5.4 million dollars.

Duty reduced by 50 percent.—Imports might supply 6 percent of consumption, or about 480,000 pounds, having a foreign value of about \$520,000. Domestic production would then be about 7.5 million pounds, with a value of about 5.3 million dollars.

Duty increased by 50 percent.—Imports might then be 2 percent of consumption, or about 160,000 pounds with a foreign value of about \$240,000. Domestic production would then be about 7.8 million pounds with a value of about 5.5 million dollars.

Exports

United States exports of optical glass have been small in pre-war years. The United States industry, however, has expanded its activities during the war to such an extent that it is now meeting not only its own civilian and military requirements, but is exporting optical glass to some of its Allies. The continuance of this export trade after the war depends on unpredictable factors, especially the future of the German optical-glass industry.

Employment

The number of workers employed in the optical-glass industry in the United States has never been large, and was about 200 in 1939. With a high national income and a production around 7.5 million pounds, the industry might employ from 300 to 500 workers.

OPTICAL INSTRUMENTS

Tariff paragraph: 228.

Commodity: Optical instruments.

Rates of duty: 30%, 35%, 45%, and 60% ad valorem. Average ad valorem rate: 47% ad valorem.

NOTE.—The rates fixed in the Tariff Act of 1930 were 60% and 45% ad valorem. The rate on certain prism binoculars was reduced from 60% to 45%, and the rate on opera or field glasses and photographic lenses from 45% to 35% and 30%, respectively, effective June 15, 1936, pursuant to the trade agreement with France. For a period of approximately 2 years the ad valorem duty on certain prism binoculars (60%) was assessed on the basis of American selling price pursuant to a Presidential proclamation under section 336 of the Tariff Act, effective January 13, 1933.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	10,812	355	10,457	2,028	12,485	Percent
Persons employed (number).....	5,000-6,000					10

¹ Landed value; foreign value was \$1,200,000.

This section covers photographic and projection lenses, binoculars, field and opera glasses, telescopes, microscopes, ophthalmic measuring and testing instruments, and a wide variety of industrial, military, laboratory, hospital, and scientific measuring and testing instruments, and apparatus in which optical elements or systems are the predominating features.¹

Before the war there were two large- and a number of medium- or small-sized concerns which produced optical instruments in the United States. Production data for optical instruments are not available since these companies also made other products in quantity, including lenses, spectacles, goggles, and professional and scientific instruments other than optical. The two larger companies produced optical glass, but the other concerns obtained their requirements of the glass from outside sources, foreign or domestic. All these companies undoubtedly have increased their capacity during the war because of the great demand for optical instruments not only for military equipment but also for measuring and inspecting commodities being manufactured for the war effort. It is believed that, from the expe-

¹ The articles covered by this report are all those dutiable under paragraph 228 except cameras of which the lens assembly accounts for the chief part of the value. Such cameras are covered along with other cameras (dutiable under par. 1551) in a separate section. The articles herein considered contain some elements similar to those treated in another section—those articles covered by par. 226 which provides for all lenses except photographic and projection lenses.

rience gained in recent years, the domestic concerns probably are now in a position to produce any and all types of optical instruments and apparatus.

In terms of value, about 60 percent of the imports, including all types, before the war came from Germany; about 20 percent came from France, and 15 percent from the United Kingdom. Imports from these three countries were very largely of precision instruments. Some nonprecision low-priced glasses, magnifiers, and telescopes came from Japan.

During the war there has been increased industrial use of optical measuring and inspecting instruments and apparatus that formerly were more largely restricted in their use to scientific and professional purposes. The estimates that follow presume that this widespread industrial use will continue and that the bulk of such instruments will be supplied by domestic production. Moreover, it is not expected that imports will supply as large a part of the photographic and projection lenses as they did before the war. In pre-war years this category of imports accounted for nearly 40 percent of the total imports of optical instruments.

Precise optical products are vital to modern warfare, and it is possible, therefore, that the German industry may be suppressed in the post-war years. In the absence of information regarding the program for the German economy, the estimates are given below for domestic production and imports under both assumptions—that German industry will and that it will not be a factor in competition. These estimates, however, are not made for the immediate post-war term since there is no reason to believe that the German industry will be an important factor for that period.

POST-WAR SHORT TERM

During the war the domestic production of optical instruments has undoubtedly been directed to a greater extent to such commodities as binoculars, range finders, bomb sights, ophthalmic instruments, and those used in medical and surgical work than would have been the case in peacetime. In view of the backlog of civilian demand it seems probable that the total United States production of optical instruments in the immediate post-war years may be equal to, or somewhat greater than, the output of 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Probably a greater consumption of optical instruments and devices may develop in the long term for industrial, professional, and educational purposes. Likewise a larger military force may be maintained than before the war, requiring heavier replacements and introduction of new or improved types of optical devices used for military purposes.

Per capita income at 1939 level.

Consumption of all optical instruments might increase 30 percent or amount to about 15 million dollars.

Duty as in 1939.—Imports might be about 10 percent of consumption or 1.5 million dollars (foreign value) and domestic production about 13.5 million dollars.

If the German industry should be suppressed, imports would probably not exceed 5 percent of consumption or \$750,000 foreign value, in which case domestic production might be as high as 14.5 million dollars.

Duty reduced by 50 percent.—Imports of binoculars, field glasses, lenses, telescopes, microscopes, and some of the optical measuring instruments might be 30 percent greater under this rate of duty than under the 1939 duty in which case imports might be about 13 percent of consumption or somewhat over 2 million dollars (foreign value) and production in the United States about 13 million.

If the German industry should be suppressed, imports might be 7 percent of consumption or 1 million dollars foreign value, and domestic production as high as 14 million dollars.

Duty increased by 50 percent.—Imports would be about 3 percent of consumption or about one-half million dollars foreign value, with domestic production approximating 14.5 millions.

If the German industry should be suppressed, imports might be a little less than 2 percent of consumption, or \$250,000 foreign value, and domestic production 14.8 million dollars.

Per capita income 75 percent higher than in 1939.

With probable increases in industrial, educational, and other uses of optical instruments, consumption might rise 50 percent above that of 1939, or to about 18 million dollars.

Duty as in 1939.—Imports, at this duty rate, might amount to 2.5–3.0 million dollars (foreign value) and production to 15.0–15.5 million.

If the German industry should be suppressed, imports might be 14 to 17 percent of consumption, or 1.2–1.5 million dollars foreign value, and domestic production 16.3–17.0 million dollars.

Duty reduced by 50 percent.—Imports may be in the neighborhood of 20 to 22 percent of consumption, with a foreign value of about 3.5–4.0 million dollars. Production may be 14.0–14.5 million.

If the German industry should be suppressed, imports might be 10–11 percent of consumption, or 1.8–2.0 million dollars foreign value, and domestic production 15.7–16.5 million dollars.

Duty increased by 50 percent.—Imports, at this higher duty, would probably be about 6 percent of consumption, or 1 million dollars (foreign value) and production about 17 million dollars.

If the German industry should be suppressed, imports might be about 3 percent of consumption, or \$500,000 foreign value, and domestic production about 17.5 million dollars.

Exports

The value of United States exports of optical instruments amounted to \$300,000–\$400,000 before the war. While Canada took about one-fourth of the total, the remainder went to nearly every country in the world, very largely in small lots. This possibly was because some domestic firms enjoyed a fairly good foreign trade in spectacles and goggles and in addition sold a few optical and ophthalmic specialties

to buyers of those commodities. It seems probable that post-war exports may be somewhat greater and rise to, say, a half million dollars.

Employment

It is estimated that 5,000 to 6,000 workers were employed in 1939 in the manufacture of the products covered by this report. With high national income and increased demands for optical instruments, the industry might employ 8,000 to 9,000.

INCANDESCENT ELECTRIC LAMPS

Tariff paragraph: 229.

Commodity: Incandescent electric lamps with metal filaments.

Rate of duty: 20% ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (millions).....	1,000	18	982	96	1,078	<i>Percent</i> 9
Value (\$1,000).....	73,066	1,424	71,642	783		
Unit value per lamp (cents) ¹	7.3	7.7	7.3	0.8		
Persons employed (number).....	9,600					

¹ Approximate.

² Foreign value.

³ In domestic production, medium and large size lamps predominated (unit value 11.3 cents). Miniature lamps constituted about 80 percent of total imports (unit value 0.64 cent) medium and large lamps about 18 percent (unit value 1.64 cents). Consequently, unit values of imports and domestic production are not comparable.

The common incandescent lamp consists of a fine tungsten wire, surrounded in a glass bulb by a vacuum or an inert gas. This type has nearly superseded the less efficient carbon lamp, but is now in competition with the new and more efficient fluorescent lamp.

Before the depression the consumption of incandescent lamps had for years increased at an average rate of about 25 percent a year; following a moderate decline during the depression, it resumed its rapid rise, at somewhat less than 15 percent annually.

Owing to a reduction in price, the value of consumption for civilian use, however, was only about the same in 1944 as in 1927. Consumption has increased largely because of the growth of electric power facilities with an accompanying decline in the cost of electricity, and because the cost of lamps has also decreased.

The future course of consumption is difficult to forecast, principally because of the uncertainty as to how rapidly the use of the fluorescent lamp may increase, but also because of the possibility that new technical developments and the progress of large power projects may make electricity available, at lower rates, to many more people. The speed at which the fluorescent lamp may replace incandescent lamps depends partly on whether its use will be actively promoted by the principal manufacturers who also dominate the incandescent field. However, sales of fluorescent lamps were about equal to incandescent

lamps in 1944 (in value) and displacement may be fairly rapid, particularly in newly constructed homes and in industrial, commercial, and institutional installations.

Incandescent lamps are made by several companies in the United States, chiefly under patents of one company which controls about 90 percent of the domestic output through its own plants or by licensing other manufacturers to use its processes and methods.

International trade in electric lamps has been influenced by agreements among the major world producers including the largest United States producer. Agreements to which the United States concerns adhere deal largely with market allocation, each company being guaranteed its home territory and a share of the market in countries where lamps are not produced.

Imports into the United States come chiefly from small companies not parties to the international agreements. They have consisted mostly of low-priced miniature lamps of inferior quality which were made in Japan. On a value basis, they supplied less than 2 percent of consumption. The largest Japanese concern was involved in the market controls.

United States exports have been small, going principally to Western Hemisphere countries and the Philippines.

POST-WAR SHORT TERM

Consumption will probably be large, owing to the resumption of building deferred during the war. Imports, however, will probably be small since Japan was a major and Germany a minor source of imports, and these two countries may not resume their pre-war exports.

POST-WAR LONG TERM

Consumption, Production, and Imports

A 50-percent increase or decrease in the duty is not likely to have an appreciable effect on the level of consumption, production, or imports. United States producers are apparently able to sell high-grade lamps more cheaply than their competitors, and the duty on inferior grades which constituted the bulk of pre-war imports was a negligible proportion of their selling price (it was about one-sixteenth of a cent per lamp in 1939). Moreover, the market control agreements of the major foreign producers may continue to affect international trade even if pending litigation under the anti-trust laws succeeds in preventing the participation of United States producers in such agreements.

Per capita income at 1939 level.

The consumption of incandescent lamps may be about 1.0-1.4 billion. This is about the same as in 1941, and is therefore somewhat higher than in 1939. However, the history of lamp consumption indicates that their use does not usually decline with a recession in the level of income which seems only to interrupt the upward trend.

The value of production will come within 800,000 to 1 million dollars of equaling consumption, since imports are likely to be at about the same ratio to consumption as in 1939, or about 100-120 million lamps, with a foreign value of about \$800,000-\$1,000,000, depending partly on the assumed rate of duty.

Per capita income 75 percent higher than in 1939.

Although the experience of the past 25 years would indicate a consumption four times that in 1939, it is unlikely that such a large increase will occur, because, among other things, the fluorescent lamp may well make more rapid progress at a high level of income. There doubtless will remain, however, many applications for incandescent lamps for which the fluorescent will be impractical or unwarranted. Consumption may reach the neighborhood of 1.5–2.0 billion lamps. Under these conditions imports might amount to about 125–175 million lamps with a foreign value of 1.0–1.4 million dollars, assuming the pre-war ratio of imports to consumption will continue. The value of production would approximate consumption.

Exports

If relations among electrical manufacturers of the world resume their pre-war status, exports from the United States will probably be confined to the Western Hemisphere and parts of Asia, Africa, and Oceania. They would probably increase somewhat, owing to an increase in demand throughout the world, with the uncertain exception of the effect of the displacement of the incandescent lamp by the fluorescent. It is possible, however, that this displacement will not progress to the same degree in the less developed export market. Exports in the post-war long term may be about 25 million lamps.

Employment

In 1939 about 10,000 wage earners were reported in the industry. The tendency has been toward a higher production per worker, as automatic machinery has been further developed. This trend may continue but is likely to be rather gradual. At the high level of national income, employment may be as much as 15,000 persons.

GLASS MIRRORS

<i>Tariff paragraph</i>	<i>Commodity</i>	<i>Rate of duty</i>	<i>Equivalent ad valorem (1939)</i>
223, 224	Glass mirrors, exceeding 144 sq. in. in size.	15¢, 20¢, or 23¢ per sq. ft., depending on superficial area.	50.1
230 (b)	Glass mirrors, not exceeding 144 sq. in. in size.	50% ad valorem.....	50.0

NOTE.—Rates under par. 223 and 224 are subject to a minimum ad valorem rate of 45 percent. If bent, beveled, etched, decorated, etc., an additional duty of 5 percent ad valorem is imposed.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	19,202	(¹)	19,202	² 175	19,377	Percent 0.9
Persons employed (estimated number).....	2,500					

¹ Negligible.

² Landed value; foreign value was \$108,000.

The chief requirements of a good glass mirror are high reflectivity and absence of distortion of the reflected image. Consequently the best glass mirrors are those made from the better grades of plate glass. Those made from cylinder or sheet glass (window glass), which represent about 25 percent of the total, are usually of an inferior grade.

Mirrors are classified for tariff purposes into two groups, based on size or superficial area. An area of 144 square inches is usually considered the dividing line between a small and a large size. Large mirrors may be framed or unframed, and either plain, bent, beveled, etched, or decorated in some manner. Those of moderate price are usually made of undecorated sheet glass while the more expensive are usually decorated and made of the highest quality of plate glass. Although the most important use for large sizes is in the home, either separately or as an integral part of furniture, large quantities are also used in hotels, theaters, restaurants, barber shops, and in mercantile shops of all kinds.

Vanity-case, pocket, shaving, puzzle, dental, surgical, and novelty mirrors are, in general, small in size. They are usually made from cylinder or sheet glass (window glass), and most of them are framed or cased with nonprecious metals, leather, paper, or wood. There are, however, some small automobile mirrors made of plate glass by the same manufacturers who produce the larger sizes.

Production of mirrors is not reported by sizes in official statistics, but trade estimates indicate that the value of production of small mirrors (not over 144 square inches) has averaged from 1.5 million to 2 million dollars a year, or approximately 10 percent of the value of total mirror production. Plate-glass mirrors, chiefly unframed, constitute the greater part of domestic production.

In 1939 there were more than 500 manufacturers in the United States reported as making glass products including glass mirrors. The number making mirrors is not separately reported. Most of those making mirrors are small establishments, located mainly in the larger cities. The larger sizes are manufactured for the most part in separate plants located in or near important furniture-manufacturing centers. Substantial quantities of mirrors are produced by plate-glass manufacturers. There is also some production of large mirrors by concerns engaged in manufacturing miscellaneous glass products.

Imports of glass mirrors constitute only a negligible part of domestic consumption. In 1939 imports of the larger sizes were only about 5 percent of the total imports and represented, it is estimated, only a very small fraction of our consumption of those sizes. They came principally from France, the Netherlands, and the United Kingdom and consisted mostly of special types. The remaining 95 percent of imports consisted of mirrors in the smaller sizes, and came largely from Japan. Most of these were of the inexpensive types, imported for sale in chain stores or by manufacturers of leather case goods and toilet sets.

POST-WAR SHORT TERM

The deferred building demand and the desire to alter or modernize present homes after the war will greatly increase the demand for mirrors, especially of the larger sizes. They will probably be used in increasing quantities in homes not only because they have become popular with decorators, but also because of their light-reflecting

properties. As more houses are built or modernized, their owners will probably want new furniture and this will also increase the demand for mirrors. During the war there has been an increase in the quantity of small mirrors used in novelties and handbags but this trend may or may not continue.

United States annual consumption of mirrors, both large and small sizes, therefore, may have a value of 35 million dollars at least, or 75 percent greater than that of consumption in 1939.

Inasmuch as the bulk of our imports before the war were in the small sizes and came principally from Japan, it is most likely that imports of mirrors after the war will be negligible.

POST-WAR LONG TERM

Consumption, Production, and Imports

The demand for both large and small mirrors may still be large during the early 1950's, especially if it be assumed that the pre-war trend in their use continues. There is a possibility that as plastics are further developed, ways may be devised to use them for mirrors, but glass is cheaper than plastic materials and so far few, if any, plastic mirrors have been sold.

Per capita income at 1939 level.

The value of mirrors consumed annually during the early 1950's may not be as high as in the immediate post-war period but may amount to 25 million dollars, about 25 percent more than in 1939. Domestic production and imports would likely supply about the same proportions of the total consumption as they did in 1939. Domestic producers would probably be able to supply most of the demand except for certain framed and engraved types, which are not consumed in sufficient quantities in this country to warrant production.

The difficulty of protecting the silvered surface of large glass mirrors from injury during ocean transportation as well as the advantages of prompt deliveries from domestic producers located nearby, which makes unnecessary the carrying of large stocks, encourages the use of the domestic product.

With the duty the same as in 1939 imports might have a foreign value of \$150,000, and a landed value of about \$240,000 and thus supply, on a value basis, about 1 percent of consumption. They might be slightly higher if the duty were reduced 50 percent and have a foreign value of \$200,000 and a landed value of about \$320,000, and thus supply about 1.5 percent of consumption. They might possibly be somewhat lower if the duty were increased 50 percent and have a foreign value of \$100,000 and a landed value of about \$160,000, and thus supply about eight-tenths of 1 percent of consumption.

Per capita income 75 percent higher than in 1939.

United States consumption of this increasingly popular article of decoration might attain a value of 40 million dollars, or approximately twice the value of the 1939 consumption. With a duty the same as in 1939, the value of imports might increase and have a foreign value of \$250,000 and a landed value of about \$400,000, and thus supply about 1 percent of consumption. With a 50-percent reduction in duty imports might be even slightly higher because of the demand for large foreign mirrors for homes in coastal areas and have a foreign

value of \$375,000 and a landed value of about \$600,000 and thus supply about 1.5 percent of consumption. With a 50-percent increase in duty they might be somewhat lower and have a foreign value of \$200,000 and a landed value of about \$320,000, and thus supply about eight-tenths of 1 percent of consumption.

Exports

Probably very few, if any, mirrors have been exported, although there are no official statistics to corroborate this statement. Mirrors are quite generally produced in most foreign countries, perhaps largely because of the difficulties and expense of shipping them any distance.

Employment

Employment in 1939 was 2,500 and at that level of income would remain approximately at that number; and with a 75-percent increase in income over 1939 or a 40-million-dollar production, the industry might give employment to 3,000 or 4,000 workmen.

MARBLE, ONYX, AND BRECCIA

Tariff paragraph: 232.

Commodity: Marble, onyx, and breccia, in the form of blocks, rough or squared only.

Rate of duty: 65¢ per cubic foot. *Equivalent ad valorem (1939):* 20%.

NOTE.—Rate on onyx reduced to 32½¢ per cubic foot, effective November 15, 1941, under the trade agreement with Argentina.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (cubic feet).....	133, 750	(1)	133, 750	73, 737	207, 487	<i>Percent</i> 38
Value.....	\$306, 945	(1)	\$306, 945	\$236, 746		
Unit value (per cubic foot).....	\$2. 30	(1)	\$2. 30	\$3. 21		
Persons employed.....	(2)					

¹ Exports of stone are not distinguished as between marble and other building and monumental stone, rough or dressed. They are probably negligible.

² Foreign value.

³ Not available.

Imports of marble, onyx, and breccia, are mostly in the form of blocks, rough or squared only, and are the raw material for the manufacture of slabs and pieces to be later used as interior decoration in building construction, mantels, lamp bases, desk sets, clock cases, and novelties. Domestic production of blocks of marble, breccia, and onyx, to be later sawed into slabs, etc., is not separately reported, but for comparative purposes the domestic production of rough-dimension stone in these materials (marble, breccia, onyx) for interior

decoration, is accepted as a material corresponding to these imports. Production of ordinary structural marble is not included.

The United States use of marble, breccia, and onyx has been declining over a considerable period of years, and it is believed the trend will continue. The imported product, which comes mostly from Italy, is usually desired for its appearance and is more expensive than the domestic product.

POST-WAR SHORT TERM

Consumption, imports, and production will probably not be much different from the pre-war period.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

In view of the probable continued decline in popularity of marble, onyx, and breccia, it is assumed that consumption will be about the same as in 1939, or about 210,000 cubic feet, despite the increase in population. A decrease or increase of 50 percent in rates of duty would not be likely to affect quantities imported, but might be reflected in changed foreign values.

With the duty as in 1939, imports would probably be about 75,000 cubic feet, or 35 percent of consumption, and have a foreign value of about \$235,000. With a 50 percent reduction in duty, the foreign value of imports might be about 10 percent greater, or \$250,000, because Italian producers would probably take advantage of the opportunity to increase prices. With the duty increased by 50 percent, imports would not decrease and might still be valued at \$235,000, because the demand for imported material is very inelastic.

Per capita income 75 percent higher than in 1939.

It is improbable that an increase in the national income will result in a similar increase in the consumption of decorative marble. The volume of public construction, where such marble is used mostly, represents usually a smaller proportion of total construction during periods of high national income than during periods of low income, although the actual volume may be somewhat greater. Moreover, there has been a definite trend in recent years towards the substitution of decorative glass for marble.

For these reasons it is probable that consumption of this type of marble in the United States may not exceed 275,000 cubic feet annually, or about 33 percent more than the 1939 consumption. It is not likely that the volume of imports will be appreciably affected by a reduction or by an increase of 50 percent in the rate of duty, although the value may change somewhat.

With the duty the same as in 1939, the foreign value of imports may amount to as much as \$270,000; with a 50 percent reduction in duty the foreign value may increase to about \$300,000; and with a 50 percent increase in duty the foreign value would probably be about the same as with no change, or about \$270,000. Domestic production under these conditions might be about 200,000 cubic feet, valued at about \$520,000.

Exports

The export trade in stone is relatively small, and two-thirds of it is with Canada. Statistics for such exports include marble, granite, and other building and monumental stone; marble, breccia, and onyx, for interior use, are not separately reported. Exports of these particular types of stone are probably negligible.

Employment

Since the production of marble, breccia, and onyx for interior use is but a small part of a large industry, separate statistics are not available as to employment.

**GRANITE, HEWN, DRESSED, SAWED,
POLISHED, OR OTHERWISE MANUFACTURED**

Tariff paragraph: 234 (a).

Commodity: Granite for monumental purposes, partly or wholly manufactured.

Rate of duty: 30% ad valorem.

NOTE.—The Tariff Act of 1930 imposed a rate of 60% ad valorem. The rate was reduced on paving blocks to 40% under the trade agreement with Sweden, effective August 5, 1935. The rate on the whole class, including paving blocks, was reduced to 30% under the trade agreement with Finland, effective November 2, 1936.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (cu. ft.).....	310,900	(1)	310,900	26,482	337,382	Percent 7.8
Value.....	\$1,991,342		\$1,991,342	\$126,168		
Unit value (per cu. ft.).....	\$6.41		\$6.41	\$4.76		
Persons employed (number).....	1,680					

1 Not available.

2 Foreign value.

The figures given in the table for domestic production include only that of grades suitable for monuments, and account for only about 3 percent of the total granite quarried in the United States. The remaining production goes into road and building construction. Very little, if any, imported granite is used in this country for such construction.

Granite for monumental purposes, used mostly in tombstones, is quarried in many widely separated sections of this country; certain colors are not found in some of the areas of production, and the demands for granite of special colors occasion transportation of the stone over considerable distances. Certain groups of consumers hold preferences for certain colored granites for tombstones. Such granite is imported largely into the coastal areas, especially when ocean freights

on imports are lower than rail freights from distant inland quarries where similarly colored granite may be obtained.

Imports of granite for monuments are largely in the form of dressed blocks or somewhat further advanced form, but only a small part of the imports are of finished monuments. Granite usually accounts for something less than half—in some cases very much less than half—the value of finished monuments. Thus the ad valorem duty results in considerably higher collections of duty on imports of finished monuments than on imports of unmanufactured granite. The production of the monuments, however, is largely on a "to order" basis so that under any likely tariff duties the great bulk of imports would probably continue to be of granite for further processing.

Some of the larger domestic companies engaged in the production of monuments have both quarries and finishing plants and use both imported and domestic granite in their finishing plants. For most such concerns, however, the production of monuments represents only a small part of their total business, which consists principally in quarrying and processing granite for other uses.

During the past two decades there has been a 50-percent decrease in the annual consumption of granite in monuments. This is because the trend has been toward the use of smaller tombstones, and because granite tombstones have become less popular than formerly.

POST-WAR SHORT TERM

Despite the downward trend in the consumption of granite for monuments it is to be anticipated that consumption in the immediate post-war period may be considerably greater than in 1939 because of the probable increased construction of memorials during that period.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Under these circumstances the downward trend in the consumption of granite for monuments might be expected to be resumed in the long run. Probably a reasonable expectation as to consumption in the early 1950's would be somewhat above or somewhat below 330,000 cubic feet depending in part on the assumed rate of duty.

Duty as in 1939.—There is no reason to suppose that imports under these circumstances would supply a materially different proportion of domestic consumption than they did in 1939. Imports might, therefore, be about 7.5 percent of consumption, or 25,000 cubic feet with a foreign value of, say, \$120,000.

Duty reduced by 50 percent.—Imports might be reasonably expected to be about 9 percent of consumption, or about 30,000 cubic feet with a foreign value of, say, \$150,000.

Duty increased by 50 percent.—Imports might be about 6 percent of consumption, or 20,000 cubic feet with a foreign value of, say, \$80,000.

Per capita income 75 percent higher than in 1939.

Taking account of the factors which have tended to reduce the consumption of granite in monuments, as well as of the higher level of income, it would seem reasonable to expect that in the early fifties

consumption might be about 50 percent higher than it was in 1939, say, 500,000 cubic feet.

Duty as in 1939.—Imports would under these circumstances probably account for a slightly higher proportion of consumption than in 1939, possibly 8 percent, and might amount to 40,000 cubic feet. If, as it seems to be reasonable to expect, the prices should be somewhat higher than in 1939, these imports might have a value of about \$215,000.

Duty decreased by 50 percent.—Imports might amount to 10 percent of consumption, or 50,000 cubic feet, with a foreign value of about \$300,000, because a much larger part of these imports would probably consist of finished monuments.

Duty increased by 50 percent.—Under these circumstances it would seem reasonable to expect that imports might amount to 6 percent of consumption, or about 30,000 cubic feet with a foreign value of possibly \$135,000.

Exports

Export statistics for granite are not available. A rather small quantity, however, is known to be exported to Canada. Exports are not expected to become a factor of much importance to the domestic industry.

Employment

It is estimated that about 580 workers were employed in the quarrying of monumental granite in 1939 and probably about 1,000 workers were engaged in the processing of the granite into finished monuments. It follows from the foregoing estimates that employment in these operations might be less to the extent of about 2 percent in the early fifties if the level of national income in that period were about what it was in 1939, and possibly 40 percent greater at a level of national income 75 percent higher than in 1939. The level of import duties under consideration might affect volume of employment to the extent of possibly 5 percent.

ASBESTOS, CRUDE

Tariff paragraph: 1616.

Commodity: Asbestos, unmanufactured, asbestos crudes, fibers, stucco, and sand and refuse containing not more than 15 percent of foreign matter.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (short tons).....	15,459	2,473	12,986	242,540	255,535	Percent 95
Value (\$1,000).....	513	219	294	19,065		
Unit value (per ton).....	\$33	\$88	\$23	\$37		
Persons employed (number).....	151					

¹ Foreign value.

Asbestos is a term applied to fibrous varieties of several minerals. The commercial varieties are chrysotile, blue asbestos (crocidolite), and amosite. These minerals, because they differ widely in composition, strength, flexibility, and length of fiber, vary considerably in their application and usefulness.

On the basis of use, asbestos falls into two classes—spinning and nonspinning fibers. Spinning fibers comprise the longer grades of these three types, and are used principally for clutch facings and brake linings in automotive equipment, and for fireproof curtains and clothing, electrical tape, sheet packings, insulating blankets for steam turbines in naval vessels, gaskets, and acid filters. The short or nonspinning fibers are employed in the production of many types of building materials.

Asbestos is produced in this country in only a relatively few States, and only in Vermont consistently, where the output is used principally for paper- and cement-asbestos products. Arizona has produced some excellent spinning fibers, but mining costs and freight rates to eastern consuming markets are high. About 83 percent of both the total quantity and value of the domestic consumption is imported, principally from Canada. The Union of South Africa supplies some chrysotile and all of the crocidolite and amosite asbestos imported into the United States.

Imports for consumption in the United States of asbestos spinning fibers in 1939 were 27,085 short tons, valued at \$3,471,463 (\$128.17 per ton) and nonspinning fibers were 215,476 short tons, valued at \$5,623,075 (\$26.10 per short ton).

Of the total consumption of crude asbestos in the United States, spinning fibers accounted for 11 percent of the quantity and 38 percent of the value, in 1939, whereas nonspinning fibers accounted for the remaining 89 percent of the quantity and 62 percent of the value.

Exports of crude asbestos from the United States are composed largely of blended fibers employed in the manufacture of asbestos roofing and siding shingles. The principal markets have been Japan, Mexico, Italy, and Germany. Reexports of imported asbestos have exceeded in some periods those exports classified as domestic, but this trade was negligible for several years before the war. Exports of manufactured asbestos products have always been comparatively large, exceeding 3.3 million dollars in 1939.

POST-WAR SHORT TERM

In the years immediately following the close of the war, the deferred demand for building construction and for automotive vehicles, will probably be reflected in an increase in consumption of crude asbestos amounting to from 40 to 50 percent over that of 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of nonspinning grades of asbestos fiber for use in the manufacture of cement-asbestos building materials may increase to as much as 20 percent over 1939, or to approximately 300,000 tons. Domestic production of crude asbestos, almost entirely of nonspinning

grades, is likely to account for only a small part of consumption, possibly 23,700–28,700 tons, having a value of \$780,000–\$950,000.

Assuming a potential post-war yearly demand of about 4.5 million motor vehicles, a large consumer of spinning-grade asbestos, the consumption of this type of asbestos may possibly exceed that of 1939 by 30 percent, and amount to about 35,000 tons supplied almost entirely by imports.

The demand in the early 1950's for all grades of asbestos, therefore, would be about 335,000 tons, or an increase of approximately 30 percent over that of 1939. The foreign value of the imports of non-spinning grades of asbestos, assuming no advance in prices over those of 1939, would be about 7 million dollars, whereas that of the spinning grades would be approximately 4.5 million dollars, making a total of 11.5 million dollars.

Per capita income 75 percent higher than in 1939.

With higher national income, consumption of crude asbestos might rise to 770,000 tons, composed of about 720,000 tons of nonspinning grades and 50,000 tons of spinning-grade asbestos. Of these quantities, imports might account for about 680,000 tons of the non-spinning and nearly all of the spinning grades. Assuming an increase of 10–15 percent in prices over those of 1939, the foreign value of the imports of the nonspinning grades would then range from 20.4–21.4 million dollars, and that of the spinning grades would be from 7.0 million to 7.5 million dollars, or a total of 27.4–30.0 million dollars. The value of the domestic production of crude asbestos, principally of nonspinning grades, would range from about 1.6–1.7 million dollars.

Exports

Exports of crude asbestos did not exceed 5,000 short tons in any year in the immediate pre-war period. Mexico and Japan were the principal purchasers. The bulk of the exports were of shingle fiber grade and were used for the manufacture of cement-asbestos products. It is not probable that Japan will be able to take its place as one of the principal importers of United States crude asbestos in the immediate post-war years but exports to certain Latin-American countries were steadily increasing in the pre-war period and this upward trend may be revived after the war. In the long run, exports of crude asbestos from the United States may increase as much as 50 percent over 1939 with a value of about \$370,000.

Employment

The number of persons employed in asbestos mining in the United States has not exceeded 200. Should domestic production in the post-war period increase 100 to 150 percent over that of 1939, it is likely that the domestic mining industry would employ from 300 to 350 persons.

QUARTZ CRYSTAL (BRAZILIAN PEBBLE)*Tariff paragraph:* 1636.*Commodity:* Quartz crystal (Brazilian pebble), unmanufactured.*Rate of duty:* Free.**GENERAL**

Data on United States imports for 1939 are given below:

Quantity (pounds).....	67, 052
Foreign value.....	\$138, 695
Unit value (per pound).....	\$2. 07

Quartz crystal, a crystallized form of silicon dioxide, SiO_2 , is very hard and occurs in colored as well as clear, transparent crystals. The deeper colored varieties are cut and polished as semiprecious gemstones, and they, as well as the colorless variety, are frequently carved into small ornaments. The fractured and broken crystals serve as a raw material for the manufacture of fused quartz. The most important use of quartz crystal, however, is in the manufacture of oscillators for use in radio, radar, and telephonic equipment. This use of quartz crystal is possible because of its excellent piezo-electric property, or the ability to respond to pressure by becoming charged electrically, or to respond to an electric charge by vibrating. Sections of quartz crystal, when cut in a given direction in relation to the axis of the crystal, and to a given thickness, will respond only to a particular radio frequency. These sections are called quartz oscillators by means of which it is possible to maintain the frequency transmission rate of a radio transmitting station within very narrow limits. Oscillators also make possible the filtering out of particular radio frequencies from a group of several. This application in telephony makes it possible to send and receive many messages at the same time over a single wire conductor.

Only a small part of the total quartz crystal produced is suitable for the manufacture of oscillators. As the production of quartz crystal in the United States is negligible, practically all of the requirements of this country are imported, largely from Brazil which controls most of the world's known supplies.

Owing to the great importance of radio communication in modern warfare, United States consumption of quartz crystal has increased greatly since 1939. Early in the war the United States Government contracted to purchase for a specified period all of the quartz crystal produced in Brazil not purchased by private interests in the United States. The apparent reason for this agreement was to insure to this country an adequate supply of the strategic high-grade crystal suitable for the manufacture of oscillators. Imports from Brazil during the war have exceeded 3 million pounds with a foreign value of more than 11 million dollars in some years. A large part of the imported crystal has not been suitable for manufacture into radio oscillators, with the result that imports of the lower-quality crystal have greatly exceeded requirements and substantial quantities have gone into the Government stock pile and industrial stocks have increased substantially. Stocks at the end of the war of high-grade crystal will probably be comparatively small but substantial quantities of oscillators may be salvaged after the war from obsolete or surplus war equipment.

In recent months Brazil has followed the policy of requiring that a certain proportion of the quartz crystal sold abroad shall consist of partially or completely manufactured oscillators. Brazil would be perfectly able to follow such a policy after the war because of her monopolistic control of the supplies of crude crystal. Under such a policy United States total imports of quartz crystal would probably not be materially affected. The imports of crude crystal would, however, be much smaller and oscillators would be imported in a correspondingly greater degree although the duty on oscillators under paragraph 233 is 50 percent ad valorem. Oscillators are almost always used as indispensable components of complicated and expensive apparatus and the cost of the oscillator represents a negligible part of the total.

POST-WAR SHORT TERM

Consumption of quartz crystal in the immediate post-war years may be somewhat greater than in 1939. It is somewhat doubtful, however, if any substantial amount of crystal will be imported because of large domestic stocks, Government as well as private, and because of the substantial quantities of oscillators that may be salvaged during the first few years after the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

Extension of the walkie-talkie radio and similar devices to law-enforcement agencies and interdepartmental communications in industry will probably bring about a greatly increased consumption of quartz crystal in the early 1950's.

Per capita income at 1939 level.

Imports may amount to about 120,000 pounds—60 short tons—having a foreign value of about \$250,000.

Per capita income 75 percent higher than in 1939.

It is possible that under this high income level much greater use than in the past would be made of low-powered radio transmitters. Consumption of quartz crystal, therefore, might amount to 250,000 pounds, with a foreign value of nearly \$600,000.

Employment

There is no United States production of quartz crystal, hence no employment. Before the war there were no firms engaged solely in the manufacture of quartz-crystal oscillators, and, although in 1945 there were 110 firms making such apparatus, few of them were solely engaged in that activity and statistics of employment are not available. About 15,000 employees is a very rough estimate for employment in the industry during the war.

CRYOLITE

Tariff paragraph: 1663.

Commodity: Cryolite (natural and artificial).

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export			
Quantity (short tons).....	1 5,000	3 311	11, 435	16, 124	Percent 71
Value (\$1,000).....			712		
Unit value (per short ton).....		\$175.89	\$62.27		

¹ Estimated, all synthetic. Does not include refined material produced from the imported natural cryolite.

² All natural, refined.

³ All natural, except 875 short tons.

⁴ Estimated.

⁵ Foreign value.

The natural mineral cryolite, sodium aluminum fluoride, occurs in commercial quantities, so far as is known, only in Greenland. Artificial cryolite, designated in the trade as synthetic cryolite, was developed in the 1920's by the Aluminum Company of America. The aluminum industry is the largest consumer of cryolite; cryolite is also used moderately in the ceramic, insecticide, and other industries. For practically all purposes, with the exception of use in abrasives, synthetic is interchangeable with the natural. During the war, the capacity to produce synthetic cryolite has been increased perhaps eightfold.

In the foregoing tabulation imports of natural cryolite are shown to have had in 1939 an average foreign value of \$62.27, as contrasted with \$175.89, the average value of exported cryolite. This great divergence between the import and export values is explained by the difference in quality brought about by concentration. Whereas imported natural cryolite contained only about 72 percent of the pure mineral, the exports were refined and virtually free of impurities. As imported cryolite had to be beneficiated before it could be used, the cost of a ton of refined natural cryolite was probably somewhere between \$175 and \$200 in 1939. No unit value is shown for synthetic cryolite of domestic manufacture in the above table, because no reliable figures are available.

The Greenland mine is owned by the Danish Government, and distribution in North and South America of imports of Greenland cryolite is controlled by one United States corporation, which is the principal grinder of cryolite to be used as an insecticide. It may be assumed that this company will continue after the war to import a limited quantity of natural cryolite for uses other than in the manufacture of aluminum.

POST-WAR SHORT TERM

It is anticipated that production of aluminum during the immediate post-war years will recede from the peak attained during the war, but will remain considerably above the 1939 level. For this reason, consumption of cryolite will likely be considerably greater than it was in 1939. Because of the greatly increased domestic capacity for producing synthetic cryolite and large and increasing stocks of natural cryolite, the chances are that imports will be small.

POST-WAR LONG TERM*Per capita income at 1939 level.*

Consumption in terms of refined cryolite may amount to about 30,000 tons. The probable production of aluminum during the 1950's would require probably about 20,000 short tons of synthetic cryolite, practically all of which will probably be produced in this country. Another 7,000 short tons of synthetic cryolite will likely be produced for use in the ceramic, insecticide, and other industries. Domestic production of the synthetic material will, therefore, probably be about 27,000 short tons, the value of which cannot at present be estimated. Possibly 4,300 short tons of natural cryolite, equivalent to 3,000 tons of refined cryolite, with a foreign value of about \$270,000, may be imported primarily for use by industries other than the aluminum industry, especially for use as insecticide.

Per capita income 75 percent higher than 1939.

Total consumption in terms of refined cryolite might amount to about 40,000 short tons, of which 37,000 tons will probably be synthetic and produced in this country. Imports of natural cryolite would still be only about 4,300 short tons, with a foreign value of about \$300,000, because of its limited use and of the substitution of synthetic material.

Exports

Since most countries with aluminum industries now produce, or have the means to produce, their requirements for synthetic cryolite, exports of this material will probably not be very large.

Employment

Synthetic cryolite is manufactured in conjunction with other products so that no figures for the number of workers employed are available. They cannot be very large, and probably only a few workers are needed for the refining of imported natural cryolite.

FLINT AND FLINT STONES

Tariff paragraph: 1679.

Commodity: Natural flint, natural flints, and natural flint stones, unground.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export	For domestic market			
Quantity (short tons).....	1, 139	(²)	1, 139	11, 987	13, 126	Percent 91
Value.....	\$14, 005	(²)	\$14, 005	\$116, 019		
Unit value (per ton).....	\$12. 82		\$12. 82	\$9. 68		
Persons employed (number).....	15					

¹ Average for the years 1936-39. 1939 production statistics are confidential. This average is composed of 444 tons of grinding pebbles, valued at \$4,024 and 695 tons of tube mill liners, valued at \$10,581.

² Not separately recorded, probably none.

³ Foreign value.

This classification includes flint pebbles in their natural state; grinding pebbles mechanically rounded from blocks of natural flint or other natural siliceous material; and roughly hewn blocks of natural flint or quartzite. Flint and grinding pebbles, ranging in size from 1 to 8 inches in diameter, are used as abrading media in ball and tube mills. Hewn blocks are used in varying sizes to line the grinding surfaces of the interior of these mills. Some of this material not suitable for grinding pebbles or liners is crushed for use as an ingredient in pottery.

Steel balls have largely replaced flint and similar materials in many grinding operations but a moderate demand for flint pebbles continues for pulverizing ceramic raw materials in which iron contamination must be kept to a minimum. In some domestic areas substantial quantities of selected pebbles, of rhyolite, basalt, granite, and other hard, tough rock are collected locally and used for grinding media but these do not enter established market channels and are not closely competitive with the imports. Some domestic production, however, by one or two concerns, largely of flint liners but also of small quantities of mechanically rounded quartzite pebbles, enter regular market channels and only this is covered by the figures for domestic production in the table at the beginning of the statement. Domestic production in the few years immediately preceding the war was substantially less than it had been some years earlier when domestic production supplied about 30 percent of the quantity and 40 percent of the value of the total pebbles and liners entering commercial markets. During the war, United States consumption has increased to about 16,600 tons and with the substantial rise in price of the material this consumption is valued at about \$270,000. Domestic production now supplies all but about 5 percent of these requirements. Some of the domestic production, however, is at costs very much higher than pre-war prices.

The bulk of the imports came from Denmark, France, and Belgium. The so-called Danish pebbles originated in Greenland, whence they were shipped to Denmark for cleaning and sorting, and these were the most preferred grinding pebbles. The imports from Belgium were principally of flint liners and were known as silex liners. In the years before the war the average unit foreign value of imports ranged from \$7.60 (1936) to \$9.68 (1939) a ton. With the increasing scarcity of the high-quality material, the unit values are to be expected in the post-war period to be at the upper level of this range or somewhat higher, especially if there is a heavy demand.

POST-WAR SHORT TERM

The domestic demand for ceramic materials, the largest users of grinding pebbles and flint liners, in the period immediately following the close of the war, should increase the requirements for these products to possibly that of the war period. The value of this consumption will probably be materially higher than it was in the pre-war period, possibly remaining at the level attained during the war. Imports will probably regain their pre-war status and supply about 70 percent of the domestic requirements.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Steel enameling has expanded considerably in recent years and the demand for ceramic materials for this use as well as for ceramic products in general will probably require somewhat more grinding pebbles and flint liners during the early 1950's than was used in the pre-war period. It is possible that consumption of these products may amount to about 14,000 tons annually. Under the assumed conditions, imports might be expected to supply about 12,000 tons of this consumption and to have a foreign value of about \$110,000. Domestic production may be valued at about \$26,000.

Per capita income 75 percent higher than in 1939.

It is probable that consumption of grinding pebbles and flint liners in the early 1950's might increase about 40 percent over that of 1939, or to about 18,000 tons. Under these conditions imports would probably be about 15,000 tons, with a foreign value of about \$165,000. Domestic production may be valued at about \$44,000.

Exports

Exports of grinding pebbles and flint liners are not separately recorded. The United States products are not comparable to those of France, Denmark, and Belgium, and it is not believed that any of the domestic pebbles or liners are exported under the export classification "All other natural abrasives."

Employment

Before the war the number of persons engaged in the mining and preparation of flint grinding pebbles and flint liners in the United States, was very small, never exceeding 15 workmen. If domestic production after the war increases about 50 percent over that of 1939 as many as 25 or 30 persons may be employed.

GYPSUM

Tariff paragraph: 1743.

Commodity: Plaster rock or gypsum, crude.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export ¹	For domestic market			
Quantity (1,000 short tons).....	3,227	9	3,218	1,308	4,526	Percent 29
Value (\$1,000).....	4,431	41	4,390	2,174		
Unit value (per ton).....	\$1.37	\$4.56	\$1.36	\$0.90		
Persons employed (number).....	1,327					

¹ Includes ground gypsum.

² Foreign value.

Gypsum is a hydrous sulfate of calcium which, when burned in kilns at low temperatures (under 400° F.), loses a part of the combined water and is known as calcined gypsum or plaster of Paris.

Gypsum is used as follows: (1) 70 percent in making calcined gypsum¹ for the manufacture of numerous building construction materials; (2) 20 percent as crushed rock for use as a retarder in the manufacture of portland cement; and (3) 10 percent as ground gypsum for fertilizers and as fillers in paints, paper, and textiles.

Commercial deposits of gypsum occur in many States. It is mined and processed in locations that serve most of the large centers of population without unduly long freight hauls. The outstanding exception, however, is the Atlantic coastal States, in which region Canadian gypsum is used almost exclusively.

Canada supplies more than 95 percent of the total imports, and Mexico furnishes most of the other 5 percent. In 1939, imports from Canada were 1.2 million tons, or 27 percent of the total United States consumption of 4.5 million tons. At tidewater along the Atlantic coast, for a number of years, large processing and fabricating plants were constructed for the sole purpose of using Canadian crude gypsum in the manufacture of building materials. Several new plants were built in this area just before the present war but were operated only a short time when the scarcity of Canadian gypsum forced them to curtail drastically their production of gypsum building products. Plans are now being made for building several new plants in this area immediately after the war, primarily to use imported gypsum. The comparatively low cost of transportation by water from Nova Scotia to these tidewater plants and their proximity to large centers of population are important factors favorable to the use of Canadian gypsum. Canada, before the war, also supplied the bulk of the land plaster (fertilizer) used in the South Atlantic States. Imports, particularly from Canada, therefore, are likely to share in the post-war period a larger proportion of the domestic gypsum market than they did in the immediate pre-war period.

¹ Calcined gypsum is dutiable under par. 205 (a) of the Tariff Act of 1930.

The total calcining capacity of the gypsum industry in the United States is estimated at about 8.8 million tons. If the industry is operated at full capacity, about 10 million tons of crude gypsum would be required. The calcining capacity of the gypsum industry in the Atlantic coastal area, including that of the new plants built or proposed, is estimated at about 2 million tons of calcined gypsum, or in terms of crude rock, about 2.4 million tons.

Wartime controls over construction and lack of shipping space for imports of crude gypsum adversely affected the domestic gypsum-products industry, especially that located along the Atlantic seaboard. The industry in this and other areas suffered from a reduced demand for gypsum in the construction of residential and office buildings, but this was compensated for in part by a strong demand for cement retarder, agricultural gypsum, and certain highly processed pre-fabricated products suitable for the economical and rapid construction of small, low-cost war and military housing.

The average unit value for the production of crude gypsum in the United States for the years 1936-39 was about \$1.48 per short ton. The average foreign value of imported gypsum for the same period was \$0.95 per ton. It appears that these prices are more representative for the immediate pre-war period than those reported for 1939, which were the lowest for a number of years.

POST-WAR SHORT TERM

In the first year or two following the end of the war, with the removal of wartime restrictions and the revival of import trade, the deferred demand for building construction will probably increase domestic consumption of crude gypsum to as much as 65 percent more than in 1939. The unit value of this consumption would probably be materially higher than it was in the pre-war period, possibly at the level attained during the war. For the reasons previously set forth, Canada's share in this consumption might increase to as much as 35 percent.

POST-WAR LONG TERM

Consumption, Production, and Imports

Post-war building construction and the consumption of crude gypsum after World War I did not reach its peak until the middle 1920's, or 7 years after the Armistice. Since restrictions on private building have already been in force for a longer period during this war than during the previous one, a proportionately larger demand for gypsum, lasting throughout the early 1950's, may be expected.

Per capita income at 1939 level.

With total construction activity assumed to be 10 percent higher than in 1939, consumption of crude gypsum would amount to about 5 million tons.

Imports might supply about 30 percent of this demand and amount to as much as 1.5 million tons, of which only a small amount, perhaps 100,000 tons, would be from Mexico and the remainder would come from Canada. The foreign value of these imports would probably be about 1.4 million dollars. Domestic production would then account for about 3.5 million tons, with a possible value of 5.0 million dollars.

Per capita income 75 percent higher than in 1939.

Upon the assumption that total construction in the United States may increase to as much as 200 percent over that of 1939, a corresponding increase in the amount of crude gypsum consumed appears likely. In this case, consumption of gypsum may rise to as much as 13.5 million tons. Of this amount, imports might supply as much as 30 percent or more, or up to 4 million tons with a foreign value of about 4.3 million dollars. Under these conditions, it would be necessary to expand considerably the present processing facilities throughout the country, particularly in the States along the Atlantic and Pacific coasts. Assuming an increase of 10 to 15 percent in prices over those of 1939, the value of domestic production (about 9.5 million tons) would rise to something like 15 million dollars.

Exports

Exports of crude gypsum will probably not increase significantly over those of the pre-war period, since most countries have an abundant supply of this raw material. Because of its low value per ton, gypsum cannot be transported economically over long distances. It moves from one country to another only where the sources of supply are relatively close to or connected by water with the consuming markets.

Employment

There has been very little variation in the output of crude gypsum per man-hour over a long period of years. Assuming that the domestic industry continues to produce about 2,500 short tons per man per year, the number of workmen employed in the production of gypsum would probably not much exceed 6,000 persons, even under conditions of maximum probable output.

SCHEDULE 3. METALS AND MANUFACTURES, AND RELATED ITEMS PROVIDED FOR IN THE FREE LIST

INTRODUCTION AND SUMMARY

All items covered by schedule 3 imports of which in 1939 exceeded \$100,000 are covered in this report, except the basket items listed below, for which estimates of post-war production and imports seemed impracticable.

Commodity	Tariff para- graph	Tariff status	Value of imports, 1939 ¹
Iron and steel manufactures, n. s. p. f.	397	Dutiable	<i>1,000 dollars</i> 142
Base-metal manufactures (except iron and steel), n. s. p. f.	397	do	223
Alloys used in manufacture of steel or iron, n. s. p. f.	302	do	3
"Other" professional and scientific apparatus.	300	do	214
Containers returned.	1615(b)	Free	2,568
Crude metallic mineral substances.	1664	do	175
Total.			3,324

¹ Foreign value.

The total number of the dutiable articles for which comments are presented is 47, including copper, which is on the free list of the tariff act but is subject to a revenue tax. The total value of the imports of these articles in 1939 was 97.3 million dollars, an amount which represents a very large proportion of the value of all dutiable items (including copper) imported under this schedule. In addition to the dutiable items this section includes reports for 16 duty-free items, imports of which in 1939 were valued at 99.2 million dollars.

Articles dutiable under schedule 3 fall into three groups: (1) Heavy iron and steel items; (2) nonferrous metals and ferro-alloys, mostly unfabricated; and (3) miscellaneous, consisting largely of advanced manufactures of metals, including items huge in domestic production but small in imports, such as electrical apparatus, machinery, motor vehicles, and tools, as well as many items of less importance; iron and steel are the basic materials for most of these articles, but other metals are used in important quantities, especially in electrical apparatus and clocks and watches. Among the duty-free articles classed with this third group are two nonmetallic articles of major importance, namely, coal and coke.

The following tabulation summarizes actual production (for the domestic market) and imports in 1939 of these three groups of dutiable articles, together with those for the related free articles, and compares these statistics with the post-war estimates of production and imports under the several assumptions as to national income and levels of duty:

Period, income level, and tariff treatment	Production for the domestic market		Imports	
	Million dollars	Percent of 1939	Million dollars	Percent of 1939
HEAVY IRON AND STEEL ITEMS				
<i>Dutiable</i>				
1939.....	3,642.7	100	15.3	100
Post-war long term:				
Per capita national income same as in 1939:				
Duty as in 1939.....	4,056.5	111	19.5	128
Duty reduced by 50 percent.....	4,056.5	111	22.6	147
Duty increased by 50 percent.....	4,056.5	111	16.1	106
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939.....	7,201.2	198	30.7	201
Duty reduced 50 percent.....	7,201.2	198	38.3	250
Duty increased 50 percent.....	7,201.3	198	23.2	152
<i>Related free items (iron ore)</i>				
1939.....	147.1	100	5.9	100
Post-war long term:				
Per capita national income same as in 1939.....				
Per capita national income 75 percent higher than in 1939.....	182.5	124	8.7	149
Per capita national income 75 percent higher than in 1939.....	295.0	201	16.5	281
NONFERROUS METALS AND FERRO-ALLOYS				
<i>Dutiable</i>				
1939.....	406.3	100	53.4	100
Post-war long term:				
Per capita national income same as in 1939:				
Duty as in 1939.....	464.6	114	58.2	109
Duty reduced 50 percent.....	405.9	100	88.0	165
Duty increased 50 percent.....	488.7	120	49.4	92
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939.....	781.4	192	231.9	434
Duty reduced 50 percent.....	669.5	165	305.7	572
Duty increased 50 percent.....	849.0	209	187.2	351
<i>Related free items</i>				
1939.....	31.3	100	87.6	100
Post-war long term:				
Per capita national income same as in 1939.....				
Per capita national income 75 percent higher than in 1939.....	32.1	102	88.6	101
Per capita national income 75 percent higher than in 1939.....	45.0	144	142.3	162
OTHER METAL ITEMS (MAINLY ADVANCED MANUFACTURES)				
<i>Dutiable</i>				
1939.....	8,370.7	100	28.6	100
Post-war long term:				
Per capita national income same as in 1939:				
Duty as in 1939.....	9,918.5	118	34.0	119
Duty reduced 50 percent.....	9,895.4	118	55.7	195
Duty increased 50 percent.....	9,935.0	119	22.1	77
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939.....	16,639.5	199	60.0	210
Duty reduced 50 percent.....	16,595.1	198	111.0	389
Duty increased 50 percent.....	16,668.8	199	37.7	132
<i>Related free items, including coal and coke</i>				
1939.....	1,060.0	100	5.7	100
Post-war long term:				
Per capita national income same as in 1939.....				
Per capita national income 75 percent higher than in 1939.....	1,125.9	106	5.5	96
Per capita national income 75 percent higher than in 1939.....	2,186.7	206	12.4	216

Ratio of imports to production in 1939—dutiable articles.

The group of heavy iron and steel products consists of four items, namely, pig iron, spiegeleisen, and iron and steel scrap, all of which are subject to low rates of duty, and the general group designated as "iron and steel products," comprising the heavy articles produced by steel works and rolling mills, the average rate of duty on which in 1939 was equal to about 20 percent ad valorem. The sum of the 1939 figures for the value of production of these four items is 3,643

million dollars, but this total involves extensive duplication of articles in different stages of manufacture. It may be roughly estimated that without duplication the value of the domestic production of this group in 1939 would have been about 2,000 million dollars. The foreign value of imports in 1939 was 15.3 million dollars, equal to about 0.7 percent of the adjusted figure for domestic production. If duties and importation expenses were added to the foreign value of imports, this ratio would of course be higher.

The sum of the 1939 figures of value for the production of dutiable nonferrous metals and ferro-alloys was 406 million dollars. This figure involves relatively little duplication; it may be roughly estimated that without any duplication the value in 1939 would have been about 350 million dollars. The foreign value of the corresponding imports was 53.4 million dollars, equal to about 15 percent of the domestic production. This percentage would be higher if imports were valued on the same basis as domestic production. The ratio of imports to production varies greatly for different individual commodities. For several of the metals there is little or no domestic production; the most important of these is nickel, which accounted in 1939 for nearly half of the total imports of this group (the duty on nickel was equal to 10 percent ad valorem). For copper, which ranks first among the items of this group in domestic production, the ratio of dutiable imports to domestic production, in terms of quantity, in 1939, was 1.5 percent.¹ Much of this dutiable copper was subsequently exported in advanced manufactures with benefit of draw-back.

The sum of the 1939 figures of value of production for the items of the third dutiable group distinguished in the table (conveniently designated as advanced metal manufactures) was 8,371 million dollars. This figure involves only a moderate amount of duplication of articles in different stages of manufacture; it may be roughly estimated that without duplication the value would have been between 7,500 and 8,000 million dollars. The foreign value of the imports was 28.6 million dollars, equal to around 0.4 percent of the adjusted value for domestic production. If duties and importation expenses were added to the foreign value of the imports, this ratio of course would be higher. For the great majority of the numerous individual articles falling in this group, the imports are extremely small in ratio to domestic production. This is true, for example, of three items, the domestic production of each of which exceeded 2 billion dollars in 1939, namely electrical machinery, motor vehicles and parts, and other machinery and vehicles. In the case of two or three items of this group, however, principally watches and jewel bearings, imports furnish a large proportion of the consumption.

Relation of post-war to pre-war production and imports.

It is estimated that with no increase in national income and assuming duties as in 1939, domestic production of heavy iron and steel would exceed the production in 1939, in terms of value, by only about

¹ In addition there were in 1939, as in other pre-war years, very large imports of copper ore and concentrates and unrefined copper for smelting or refining in bond (with no payment of duty) in the United States, the resulting product being exported. These duty-free imports are, of course, not included in the above table under dutiable items; they are also not included under duty-free items, on the ground that these transactions scarcely constitute import and export trade in the ordinary understanding of those terms, and also because of the virtual impossibility of making post-war estimates regarding them. Statements similar to those concerning copper also hold with respect to lead and zinc, though to much less important extent.

the percentage of growth in population. Imports, although very small in ratio to production, would probably show a somewhat greater percentage of increase, because certain reductions in duty which went into effect on January 1, 1939 (trade agreement with the United Kingdom) are expected to have somewhat more influence on imports in the post-war period than they were able to exercise in 1939 itself.

On the same assumptions regarding income and duties, it is estimated that the domestic production of dutiable nonferrous metals and ferro-alloys in the post-war period would exceed that in 1939 by a little more than the percentage of increase in population, but that the increase in imports would be small. As regards the great group of dutiable advanced metal manufactures, it is estimated that under these conditions the post-war production and imports would both show increases over 1939 figures appreciably exceeding the percentage of growth of population; this fact is explained chiefly by the general upward trend in the use of machinery, vehicles, and apparatus both by producers and consumers—a phenomenon particularly marked in the case of electrical equipment.

Effect of high national income on production and imports.

It is estimated that with national income 75 percent higher than in 1939, and with no change in duties, the value of the domestic production of heavy iron and steel in the post-war period would exceed the value at the lower income level by about 80 percent, and that the imports, although still small in ratio to domestic production, would show almost as great a percentage of increase. For dutiable nonferrous metals and ferro-alloys the difference between the low and the high income level with respect to the value of domestic production is about 70 percent, but the imports might be as much as four times greater (with no change in duty) under the higher than under the lower level of income. The reason for the difference between production and imports in this respect lies in the possibility that, with the depletion of their reserves accelerated by the war, domestic producers of the principal nonferrous metals (copper, lead, and zinc) might not increase their output proportionately to the great increase in consumption which would likely take place. With respect to the third group of items distinguished in the table, dutiable advanced metal manufactures, the effects of high income on production and imports would be substantially similar to those mentioned as to heavy iron and steel.

Effects of changes in duties on production and imports.

For heavy iron and steel and advanced metal manufactures the effects of 50 percent changes in rates of duty upon production and imports would be much smaller than for the second group of nonferrous metals and alloys. Of course, if national income should be 75 percent higher than in 1939 and at the same time rates of duty 50 percent lower than in 1939, there would be a cumulative effect in increasing the combined foreign value of the imports of all items dutiable under schedule 3 above the 1939 figure; this effect would be most substantial with respect to the group of nonferrous metals and ferro-alloys, for reasons already suggested.

Duty-free items.

The only duty-free item in the group of heavy iron and steel is iron ore, of which the imports are relatively small compared with the domestic production. It is estimated that both production and imports of iron ore will be materially larger in the post-war period than in 1939, even if national income shows no change, and that with high national income the increase in both would be very marked.

The number of duty-free articles in the group of nonferrous metals and ferro-alloys is large, most of them being alloying metals; of some of these there is very little production in the United States. In 1939 the total value of imports of duty-free articles of this group was nearly three times that of the domestic production. It is estimated that with national income as in 1939, both the production and the imports of these articles would show less percentage increase over the 1939 figures than that in population. Both production and imports, however, would be much larger if national income were 75 percent higher than in 1939.

There are relatively few duty-free advanced metal manufactures, the most important items being agricultural machinery, shoe machinery, barbed wire, and needles. However, coal and coke, which are more closely related to schedule 3 than to any other of the duty-fixing schedules, are major items in domestic production and of some importance in imports; they are included with the duty-free articles of metal in the figures given for the third group in the table. The total value of the domestic production of the duty-free articles in this third group is many times greater than that of the imports; this is true also of most of the individual items. It is estimated that, with national income as in 1939, the post-war production and imports of these duty-free articles would not be very different from the 1939 figures, but that an increase of 75 percent in the national income would approximately double production and imports.

Margins of error.

As pointed out in the general introduction, the summary estimates in the table above are subject to appreciable margins of error. The margin of error is probably greatest in the group of heavy iron and steel products, both because the number of items is small and because of the dominance, both in imports and in domestic production, of the one large composite item designated as iron and steel products. For the group of nonferrous metals and ferro-alloys, and the group of dutiable advanced metal manufactures, the total number of items is large, and even the number of big items is considerable, so that the errors in the estimates for the individual items may tend to offset each other.

PIG IRON

Tariff paragraph: 301.

Commodity: Pig iron.

Rate of duty: \$0.75 or \$1.125
per long ton.

Equivalent ad valorem (1939): 6.3%
(average).

NOTE.—Pig iron is subject to additional duties for alloy content. Imports of alloy pig iron were nil in 1939 and have been nil or very small in other years.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 short tons).....	34,809	198	34,611	43	34,654	Percent 0.1
Value (\$1,000).....	1 590,000	3,436	587,000	1 663		
Unit value (per ton).....	\$17.00	\$17.00	\$17.00	\$15.00		
Persons employed (number).....	19,500					

¹ Approximate value at blast furnace as reported by U. S. Bureau of Mines.

² Foreign value.

Because of war conditions, imports were abnormally low in 1939, being 63 percent less in quantity and 57 percent less in foreign value than in 1936-38. For that reason, a summary table of production, exports, imports, and consumption for a more representative and fairly recent pre-war period (1936-38 average) is shown below:

Item	1936-38 (annual average)					Ratio of imports to consumption
	Production	For export	For domestic market	Imports	Apparent consumption	
Quantity (1,000 short tons).....	31,693	456	31,237	115	31,352	Percent 0.4
Value (\$1,000).....	1 540,000	8,886	531,000	1 1,645		
Unit value (per ton).....	\$17.00	\$19.00	\$17.00	\$13.00		

¹ Approximate value at blast furnace as reported by U. S. Bureau of Mines.

² Foreign value.

Pig iron is a product of the blast furnace and is used, generally together with iron and steel scrap, in making steel ingots and other ferrous products. Most of the pig iron is consumed in the same plant where it is produced, and usually in the molten condition in the continuous process of making steel. Normally, only about 15 percent of the output is sold in the open market, going chiefly to iron foundries and small steel plants without blast-furnace facilities. Production for sale averaged about 5.4 million tons annually in the years 1936-38; imports were equal to about 2 percent of this figure. Imports compete directly with the part of the output produced for sale. Because of transportation costs, imported iron is consumed within a relatively short distance from the port of entry.

Except in time of war, supplies of scrap are usually plentiful, and the industry as a whole uses slightly more scrap than pig iron. As pig iron and steel are the foundation of practically all industry, production and consumption of them follow changes in national income rather closely. These statistics are important components in most indices of business activity and are sometimes considered to be, in themselves, the most reliable indicators of the level of industrial activity.

POST-WAR SHORT TERM

Production and consumption of pig iron may be very much above 1939 levels, because of the huge backlog of civilian demand for iron and steel and the assumed high level of per capita income.

Imports are likely to be small because India and the Netherlands, the principal pre-war suppliers, probably will have much less pig iron for export than formerly. It seems likely that India will need more of its pig iron for the local manufacture of steel. During the war, Indian steel capacity has been expanded more rapidly than blast furnace capacity. It is probable that less Netherlands pig iron will be available for shipment overseas because it will be required for reconstruction in Europe. It is understood that the Netherlands blast furnaces have been bombed.

POST-WAR LONG TERM

Consumption, Production, and Imports

The equivalent ad valorem rate on pig iron is low, amounting to 6.3 percent in 1939. In the following discussion, it is assumed that duty changes within the limits stipulated would have no effect upon the rate of consumption and but little on the rate of importation.

Per capita income at 1939 level.

It seems probable that consumption may be 38-42 million tons; that is, 10-20 percent above the 1939 level. The growth of population would account for most of any increase that may occur.

Imports (on all three assumptions as to duty) may be 100,000-150,000 tons (1.5-2.2 million dollars, foreign value), or equal to 90-130 percent of the 1936-38 average. The unit value is taken as unchanged from 1939 (\$15 per ton). As previously explained, imports were abnormally low in 1939 because of war conditions. In these later post-war years, foreign countries may have larger quantities for export than in 1939.

Production for the domestic market may be 37.8-41.9 million tons, with a value of 640-710 million dollars (\$17 a ton, the average for 1936-38, and also for 1939). Assuming that only about 15 percent of the production will be sold outside the producing plants (as before the war), the imports estimated above would be equal to 1½-2½ percent of the production for sale.

Per capita income 75 percent higher than in 1939.

The consumption of pig iron may be about 60-65 million tons, or 70-90 percent above the 1939 level. Large quantities of pig iron and scrap will be required for the production of steel ingots and other ferrous products at a rate equaling or even exceeding maximum wartime levels.

Imports of pig iron (on all three assumptions as to duty rates) may be about 150,000–200,000 tons (2.5–3.4 million dollars, foreign value). On this basis, imports would increase from 30–75 percent in quantity above the 1936–38 level. The unit value of imports is taken at \$17 a ton, compared with \$15 in 1939, more or less in conformity with anticipated increases in general price levels. It seems likely that foreign countries will have more pig iron for export to the United States than in 1939, although there may be shifts in the relative importance of the various sources.

Production for the domestic market may be 59.8–64.8 million tons, with a value of 1,200–1,300 million dollars (\$20 a ton, or about 17½ percent higher than at the lower income level).

Exports

Foreign tariffs on pig iron in normal United States export markets are generally low. Such changes as may be made probably will have little or no effect on the trade.

Depending chiefly on world income levels and relative foreign and domestic costs and prices, exports may range from about 10,000 to 100,000 tons, compared with nearly 200,000 tons in 1939. The export trade of the United States was abnormally large from 1937 to 1941 because of war conditions first in Asia and later in Europe.

Employment

About 19,500 workers were employed in the blast-furnace industry in 1939. Because of greatly improved blast-furnace practice and efficiency, increases in employment in this branch of the industry may not be as great as in many other lines of production. Employment will probably increase somewhat less than production as estimated because of this factor.

IRON AND STEEL SCRAP

Tariff paragraph: 301.

Commodity: Iron and steel scrap. *Equivalent ad valorem (1939):* 7.6 percent (average).

Rate of duty: 75 cents per long ton.

NOTE.—Subject to additional duties for alloy content. These alloyed imports represent a very small part of the total. Under Public Law 497, 77th Cong., effective March 14, 1942, scrap is free of duty for the duration of the emergency.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 short tons).....	40,298	3,986	36,294	83	36,327	Percent
Value (\$1,000).....	1 564,000	54,790	1 509,210	1 302		0.1
Unit value (per ton).....	1 14.00	13.75	1 14.06	36.13		
Persons employed (by dealers) (number).....	15,809					

1 Estimated.

2 Foreign value.

Imports were abnormally low in 1939 largely because Canada, our principal source, restricted exports in order to conserve supplies for the manufacture of armaments; in 1939 imports were 65 percent less in quantity and 69 percent less in foreign value than in 1936-38. For that reason, a summary table of production, exports, imports, and consumption for a more representative pre-war period (1936-38 average) is shown below:

Item	Production			Imports	Appar-ent con-sump-tion	Ratio of imports to con-sump-tion
	Total	For export	For domestic market			
Quantity (1,000 short tons).....	39,960	3,322	35,638	93	35,731	Percent 0.3
Value (\$1,000).....	1 506,000	47,752	1 458,248	1 985		
Unit value (per ton).....	1 \$13.00	\$14.37	1 \$12.86	\$19.59		

¹ Estimated.

² Foreign value.

The iron and steel industry ordinarily uses somewhat larger quantities of scrap than of pig iron in the over-all production of steel ingots and other crude ferrous products. Normally about one-half of the scrap consumed by the industry is produced as a byproduct of its own operations; the remainder is purchased from dealers and railroads or from automotive and other concerns which process iron and steel into more finished articles.

Except during periods of peak iron and steel production, as during the present war, the supply of scrap is plentiful. Most of the scrap is used in the manufacture of steel ingots and castings, but considerable quantities are also used in the manufacture of iron castings and other iron products. Since the cost of transporting scrap is high in relation to its value, United States foreign trade has generally been small. Imports come mostly from Canada, Cuba, Mexico, and other nearby countries. The abnormally large exports in 1939 went largely to Japan, the United Kingdom, and Italy, and were used in their war programs. During the period from the end of World War I to the time when Japan began military preparations for the invasion of Manchuria (1919-30), United States exports of scrap averaged 222,000 tons annually.

POST-WAR SHORT TERM

During this period, deferred civilian demand is likely to maintain steel production at high levels, although probably somewhat below the wartime peak. The supply of scrap from surplus war materials and other sources probably will be adequate to permit the restoration of the normal ratio of scrap to pig iron in the making of crude iron and steel.

Imports may increase above the level of 1939, but probably will continue to amount to only a fraction of 1 percent of consumption.

POST-WAR LONG TERM

Consumption, Production, and Imports

The equivalent ad valorem rate on scrap (7.6 percent in 1939) has been so low that changes in the rate of duty within the limits stipulated would have little or no effect on importation or consumption.

Per capita income at 1939 level.

It seems likely that the consumption of scrap may be about 40 million tons. This would represent an increase of 10 percent above the 1939 level, attributable to the growth of population.

Imports may be within the range of 50,000-100,000 tons (\$450,000-\$900,000 foreign value), or much above the abnormally low level of 1939. It is assumed that the unit value (foreign) of imports would be about the same as in 1939. It seems likely that Canada and other nearby countries will have ample supplies to restore the rate of importation to normal peacetime levels. In any event, it is probable that imports would represent less than 1 percent of consumption.

Production for the domestic market might amount to about 39.9 million tons valued at 559 million dollars (\$14 per ton).

Per capita income 75 percent higher than in 1939.

At this income level, the consumption of scrap may equal or even exceed the wartime rate, possibly amounting to 60-65 million tons. With a high income level, the iron and steel industry probably would be operating at a high rate, and very large quantities of scrap would be required. Pig iron and scrap are interchangeable in use within certain limits. Ample supplies of pig iron probably will be available from expanded blast furnace facilities and that fact may tend to maintain scrap prices at fairly low levels. Supplies of scrap probably will be adequate.

Imports may be about 100,000-150,000 tons (1.0-1.5 million dollars foreign value). The unit value of imports is estimated at \$10, compared with \$9.13 in 1939, in line with anticipated increases of general price levels. Production for the domestic market would then be nearly equal to total consumption (estimated at 60-65 million tons, with a value, at perhaps \$15-\$16 per ton, of 900-1,050 million dollars).

Exports

Because of war programs, first in Asia and later in Europe, United States export trade in scrap reached abnormally high levels from 1933 to 1941. In the long-term post-war period, it seems likely that exports will decline to peacetime levels. As previously indicated, they amounted to an average of 222,000 tons in 1919-30. They may be 100,000-500,000 tons with world income at the 1939 level or higher. It is probable that exports will be very small in comparison with the large domestic production.

In our principal export markets, scrap is usually free of duty, or the rates are so low that the trade would probably be little affected by changes in tariff levels.

Employment

Nearly 16,000 workers were employed by the scrap dealers in 1939. The number of workers per ton of scrap may not vary appreciably from the level of 1939. Labor used in steel works and fabricating

plants which might be allocated to scrap production cannot be segregated.

SPIEGELEISEN

Tariff paragraph: 301.

Commodity: Spiegeleisen (less than 30% manganese, more than 1% carbon, not containing dutiable alloy).

Rate of duty: 75¢ per ton.

Equivalent ad valorem (1939): 2.2%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption ²	Ratio of imports to consumption
				<i>Percent</i>
Quantity (long tons).....	91,491	38,264	129,755	29
Value (\$1,000).....	2,484	1,330		
Unit value.....	\$27.16	\$34.75		

¹ Exports not separately classified. A total of 2,923 long tons of ferromanganese and spiegeleisen, valued at \$247,798, was exported.

² Slightly overstated since exports are not deducted.

³ Foreign value.

Spiegeleisen, an alloy of iron and manganese containing about 25 percent manganese, is consumed exclusively by the steel industry. United States production, principally from domestic ores, has ranged from 65 to 85 percent of domestic requirements. The remainder has been largely imported from Canada; minor amounts have come from Norway. The imported material has a lower carbon content than the domestic alloy, the difference being due to the method of manufacture.

Spiegeleisen and ferromanganese, both alloys of manganese and iron, can be manufactured in the same electric furnaces abroad. Imports of spiegeleisen have fluctuated inversely with the operating rate of the steel industry. This is because it is more profitable for the foreign producers to manufacture and export ferromanganese, as its value is at least double that of spiegeleisen. When the operating rate of the domestic steel industry is high, the foreign furnaces are taxed to capacity producing ferromanganese, so that little or no spiegeleisen is produced for export. When the operating rate of the domestic steel industry falls below 75 to 80 percent, the demand for imported ferromanganese falls much below foreign furnace capacity, and the excess capacity is then utilized in producing spiegeleisen. This condition is likely to continue unless the foreign producers increase their furnace capacity. In 1939, imports of spiegeleisen from Canada alone amounted to 37,470 long tons, then declined in the following years of high steel production until they were practically insignificant in 1943.

Spiegeleisen is used mainly in the manufacture of high-carbon steel by the Bessemer process. The foreign, or low-carbon, alloy can be used to a limited degree as a substitute for ferromanganese in the open-hearth and electric furnace. The use of the high-carbon alloy in such furnaces is generally impracticable because too much carbon is introduced into the steel in proportion to the amount of manganese.

Considering the low equivalent ad valorem rate (2.2 percent), it seems improbable that imports would be affected by changes in duty.

POST-WAR SHORT TERM

If it is assumed that the steel industry will probably be operating at a rate about 10 percent below the present peak,¹ it will consume about 160,000 long tons of spiegeleisen, an increase of approximately 23 percent over the quantity consumed in 1939. It is expected that imports will continue in about the same ratio to consumption, and come from the same sources.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

By reason of increase in population, the steel industry (producing 55 to 60 million tons of steel) should consume something like 140,000 long tons of spiegeleisen, approximately 3 percent more than in 1939. Assuming imports to supply 30 percent of consumption, they would probably amount to 42,000 long tons having a foreign value of about 1½ million dollars. Domestic production would then be about 98,000 tons, valued at approximately 2½ million dollars. (Both value estimates are based on 1939 average unit values.)

Per capita income 75 percent higher than in 1939.

With greatly expanded national income, steel production should be 60 percent greater than with income as in 1939,¹ and total 90-95 million tons. The consumption of spiegeleisen would rise proportionately, probably to 210,000 long tons.

As in the past, at the higher operating rate of the steel industry, imports of spiegeleisen would be insignificant, probably amounting to not more than 2,000 long tons, having a foreign value of only \$80,000. Domestic production would then have to reach 208,000 long tons, valued at about \$6,240,000. Value figures are based on average unit values somewhat higher than those of 1939.

Exports

In 1943 there were only six furnaces in the United States producing spiegeleisen, four of which were owned by the major steel companies. It is probable that only a small part of the industry's output reaches the open market. Since the industry is geared to serve only domestic requirements, the United States is not likely to become an important exporter of this commodity.

Employment

Statistics on employment in this industry are not available, but the number of workers is relatively small.

¹ See section in this series on iron and steel.

MANGANESE ORE, METALLURGICAL

Tariff paragraph: 302 (a).

Commodity: Manganese ore (containing 35% and over of manganese).

Rate of duty: $\frac{1}{2}$ ¢ per pound of manganese content. Equivalent ad valorem (1939): (on dutiable imports) 43%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 1 cent per pound on manganese content, which rate was reduced to $\frac{1}{2}$ cent per pound, effective January 1, 1936, pursuant to the trade agreement with Brazil.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production	Exports	Imports ¹	Apparent consumption	Ratio of imports to consumption
Quantity (long tons).....	26,347	None.....	627,129	653,476	Percent 96
Value (\$1,000).....	731		8,498		
Unit value.....	\$27.74		\$13.55		
Persons employed (number).....	62				

¹ Includes ore imported duty-free from Cuba.

² Excludes production of "miscellaneous" manganese ore reported to have been 2,900 long tons in 1939.

³ Foreign value.

Manganese ore containing 35 percent or more of manganese is used principally in making ferromanganese, which is consumed in the production of steel. The United States has only small known reserves of this high-grade ore and large imports are essential to sustain the domestic steel industry. Soviet Union, Cuba, the Gold Coast, Brazil, and British India have been the principal sources of United States imports.

Since the major part of manganese ore is absorbed by the steel industry, the rate of consumption is governed almost entirely by the trend of steel production. Moreover, the demand is determined by formula requirements for metallic manganese and has little relation to price. It may be presumed, therefore, that variations in price that might result from changes of duty in either direction would have little or no effect on consumption.

The United States Bureau of Mines has been conducting research to improve the method of beneficiation of domestic low-grade ores. Although until now the results have not been promising, it may be possible that the experiments will eventually prove more successful. If this should happen, the estimates given below of domestic production and, of course, imports, would be greatly affected.

POST-WAR SHORT TERM

On the assumption that in the years immediately following the war the steel industry will be operating at about 10 percent below its present wartime peak,¹ it will consume 1.4–1.45 million long tons of manganese ore of metallurgical grade, or a little over twice the 1939 tonnage. As in the past, the United States will have to rely on foreign ore for 90–95 percent of its requirements.

¹ See section on iron and steel in this series.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—On the assumption of a 10 percent increase in population, steel production (and hence the consumption of manganese ore) may expand about proportionately, and perhaps a little more.² This expansion would require about 725,000 tons of manganese ore, about 95 percent of which would probably be imported. On the basis of 1939 figures, such imports would likely have a foreign value of 9-9½ million dollars. Production might possibly be somewhat greater than in 1939, possibly attaining a level of 35,000 tons, valued at \$970,000; such an increase, however, is doubtful.

Duty reduced by 50 percent.—It may be presumed that an even larger proportion of consumption would be imported under a lower duty. The absolute increase in imports, however, would be rather small. The increase in imports might displace two-fifths of domestic production (leaving about 21,000 long tons valued at approximately \$580,000), in which case they would be about 2 percent larger than estimated above, or about 704,000 tons, having a foreign value of about \$9,850,000.

Duty increased by 50 percent.—An increase in duty would result in a small decrease in imports. An increase of 35,000 tons in domestic production to a little more than double the 1939 figure (about 60,000 tons, valued at approximately \$1,665,000) might occur, but this would still leave imports somewhat above the level of 1939, or about 665,000 long tons, having a foreign value of approximately \$9,310,000.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Steel production, on the basis of a larger population and greatly expanded national income, should be nearly double that of 1939,² and consumption of manganese ore will rise proportionately. It would probably therefore amount to 1,300,000 tons. Domestic production might supply, depending on tariff treatment (within the limits of change specified in the Senate resolution), a minimum of perhaps 1 percent, or a maximum of possibly 4 percent of this amount (say, as an intermediate figure 32,500 long tons, valued at about 1 million dollars).

The price of manganese ore may be expected to follow general changes in world price levels, since it is drawn from many sources, moves freely in international trade, and is not under cartel control. Should the general price level be about 15 percent higher than in 1939, United States imports amounting to perhaps 1,267,500 long tons might have a foreign value of approximately 19 million dollars.

Duty reduced by 50 percent.—No decrease in duty would affect the regular rate of consumption of the steel industry. A decrease, however, would probably mean that domestic production would decline, which would result in a corresponding small increase in imports. Assuming a 50 percent decrease in domestic production (to 16,250 long tons, valued at about \$500,000), imports may reach 1,283,750 long tons, having a foreign value of approximately \$19,500,000.

Duty increased by 50 percent.—Consumption would not change; domestic production might perhaps increase to a limited degree and,

² See section on the steel industry in this series.

as heretofore, more than 90 percent of our requirements would still have to be imported, possibly 1,225,000 long tons, having a foreign value of about \$17,600,000. Domestic production may increase to almost 6 percent of consumption, or approximately 75,000 long tons valued at \$2,400,000.

MANGANESE ORE, FERRUGINOUS

Tariff paragraph: 302 (a).

Commodity: Ferruginous ore (containing more than 10 and less than 35 percent manganese).

Rate of duty: $\frac{1}{2}$ ¢ lb. on manganese content. *Equivalent ad volorem (1939):* 77%.

NOTE.—The rate of duty fixed in the Tariff Act of 1930 was 1 cent per pound on manganese content, which rate was reduced to $\frac{1}{2}$ cent per pound, effective January 1, 1936, pursuant to the trade agreement with Brazil.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (long tons).....	239,544	0		30,684	270,228	<i>Percent</i> 11
Value (\$1,000).....	934			1130		
Unit value.....	\$3.90			\$4.23		
Persons employed (number).....	495					

¹ Foreign value.

Ferruginous manganese ore is used to make spiegeleisen, which enters into the production of certain kinds of steel. Unlike manganese ore of metallurgical grade (over 35 percent manganese content), reserves of which are meager in the United States, ferruginous ore with its lower manganese content is relatively plentiful.

The Union of South Africa was the sole source of imports in 1939. Ferruginous ores vary in grade, and only those of somewhat higher grade than domestic ores are imported. Some of the imported ores also have a lower phosphorus content than the general run of domestic ore and are thus preferred for some metallurgical operations.

The amount of manganese used in the production of a ton of steel is determined by formula requirements and is largely independent of price considerations. Consumption of ferruginous ore is governed entirely by the trend in steel production. The relative proportions of consumption supplied by imports and domestic production will be affected by tariff changes, although the dissimilarities between domestic and imported ores (slight though they may be) will prevent this effect from being as great as if the two classes of ores could be perfectly substituted for each other.

POST-WAR SHORT TERM

If the steel industry in the first few years after the war operates at the rate of about 80 million tons annually,¹ consumption of ferruginous ore will probably be about 650,000–700,000 long tons. Although this consumption would be 2½ times that of 1939, it would be about 10 percent less than present wartime consumption. Imports might be expected to furnish 10–12 percent of total consumption, as in 1939, if Government stock piles are not liquidated; otherwise they would furnish a smaller amount.

POST-WAR LONG TERM

Per capita income at 1939 level.

Assuming that the steel industry is operating at an annual rate of about 55–60 million tons¹—a 10 percent increase over 1939 because of growth of population—the consumption of ferruginous ore might approximate 300,000 long tons annually. Consumption would not be materially influenced by changes in the rate of duty.

Duty as in 1939.—Assuming that the competitive position of the imported and the domestic product remains about the same as in 1939, imports might supply 30,000 long tons annually, with a foreign value (at 1939 unit values) of \$125,000. Domestic production would then run 270,000 tons with a value, at 1939 prices, of about \$1,000,000.

Duty reduced by 50 percent.—Notwithstanding a high equivalent ad valorem (77 percent in 1939) and unit values much in excess of those of domestic ores, foreign ores have been imported in substantial amounts. It is probable, therefore, that under a lower duty they would be imported in considerably larger volume, perhaps as much as 200 percent greater than in 1939, or 100,000 tons annually. The foreign value of imports, therefore, on the basis of 1939 unit values, would be about \$425,000. Domestic production in that case would amount to 200,000 long tons, with a value of \$780,000.

Duty increased by 50 percent.—Before 1936, when the duty on imports of manganese ore in all grades was 1 cent a pound on manganese content, only ore with a manganese content of 35 percent or more was imported. The duty was presumably prohibitive for the lower grades of ore. Under the one-half cent a pound rate in 1939, low-grade ore was imported, but only in an amount equivalent to about one-fifth of total imports of manganese ore. It appears, therefore, that restoration of the 1 cent rate would again be prohibitive of imports and that a ¼-cent rate (50 percent increase in present rate), might bring about the same result, or at least a strongly restrictive effect. It seems likely that imports would not exceed 10,000 tons, with a foreign value of perhaps \$42,000. Domestic production would then be 290,000 long tons valued at about \$1,130,000.

Per capita income 75 percent higher than in 1939.

Under this assumption steel production might range from 90 to 95 million tons,¹ and the consumption of ferruginous ore under those conditions would probably be 550,000 long tons annually. Consumption would not be much affected by changes in price or tariff treatment.

¹ See section on iron and steel in this series.

Duty as in 1939.—There would be no reason, under these conditions, to expect the competitive relationship of imports and domestic production to be substantially different from that which would exist at the lower income level. Imports might supply 55,000 long tons annually. The unit values would probably be 15 percent higher than in 1939, bringing foreign import values up to \$275,000. Production might amount to 495,000 tons, with value per ton about 10 to 15 percent higher than in 1929, or about \$2,225,000.

Duty reduced by 50 percent.—For reasons outlined above, a reduction of 50 percent in the rate of duty would stimulate imports considerably, perhaps to as much as 30 percent of consumption. They might thus amount to about 165,000 long tons, with a foreign value of about \$825,000. Production would, therefore, amount to 385,000 long tons, having a value of \$1,732,000.

Duty increased by 50 percent.—An increase in the duty would probably have a sharp effect in curtailing imports. The ratio of imports to consumption might be no more than half as great as in 1939. This would assume imports of 30,000 long tons annually, valued at \$150,000 (foreign value). Production would then approximate 520,000 long tons, with a value of \$2,340,000.

TUNGSTEN

Tariff paragraph: 302 (c).

Commodity: Tungsten ore (concentrates).

Rate of duty: 50¢ lb. (on metal content). *Equivalent ad valorem on dutiable imports (1939):* 60%.

GENERAL

Data on United States production, imports, and consumption for 1940¹ are given below.

Item	Metal content	Value	Value per pound
United States mine production (for sale).....	Short tons 2,531	1,000 dollars \$ 6,576	\$ 1.30
Imports: ²			
For smelting, refining, and export (duty-free).....	674	\$ 1,023	.75
For domestic consumption.....	2,806	\$ 4,691	
Total.....	3,480	\$ 5,714	
Exports: withdrawals from bonded smelter.....	674		
Apparent consumption.....	4,537		
Ratio of imports for consumption to apparent consumption (percent).....	52		

¹ Reported values are "mine" values and are lower than market quotations.

² Includes imports of tungsten in ore only. Imports in other forms are insignificant.

³ Foreign value.

⁴ This figure includes 502 tons of tungsten on which draw-back of duty was paid upon exportation of manufactured articles containing tungsten.

Approximately 75 percent of the tungsten ore consumed in the United States goes into ferrotungsten (in turn used for alloying steel) or is used directly in making tungsten alloy steels. The remaining 25 percent goes into making tungsten metal, tungsten carbide, and various chemicals. Practically all tungsten consumed in the United

¹ 1940 is used because 1939 imports were abnormally low. Comparable figures for 1939 are as follows: United States mine production, 2,040 short tons valued at \$4,402,000; duty-free imports, 295 short tons valued at \$414,000 (foreign value); imports for domestic consumption, 743 short tons valued at \$998,000 (foreign value); exports (withdrawals from bonded smelter), 295 short tons; apparent consumption, 2,783 short tons; ratio of imports for consumption to apparent consumption, 27 percent.

States is ultimately used either in tools for cutting steel or in steel alloys of great strength, hardness, and resistance to heat. Tungsten tools are essential for mass production. Over a considerable period the consumption of tungsten has increased both absolutely and relatively, compared with steel, although this tendency has become less marked because substitutes such as molybdenum are now being used. Molybdenum cannot be substituted for tungsten in all its uses, but as long as the price of molybdenum remains substantially below that of tungsten, many of the wartime substitutes for tungsten may be continued after the war. There is possibility of a wider use of high-melting point alloys containing tungsten in equipment such as superchargers and gas-turbo-generators.

United States consumption of tungsten in ore for the period 1929-38 is estimated to have averaged about 2,000 tons annually, reaching a low of 200 tons in 1932 and a high of about 4,500 tons in 1937; the 1940 figure was materially higher.

The world price is largely determined by Chinese and other Far Eastern production; the domestic mine value of tungsten is usually higher than the world price by about the amount of the United States import duty.

Domestic mine production practically ceased for a period of 4 years or more after World War I, but reached 500 tons annually in the late 1920's and about 1,500 tons annually in the late 1930's. New deposits have been discovered in the United States since 1940. With the aid of increased prices, domestic output reached a peak of 5,679 tons in 1944. Most tungsten mines in the United States are relatively short-lived, a fact which must be remembered constantly in considering forecasts of domestic output for any extended period.

During the 1930's imports supplied about 45 percent of domestic requirements. In years of high industrial activity imports amounted to about 2,200 tons, but in years of reduced activity they fell almost to the vanishing point, and domestic mines then supplied the greater part of the total requirements. China furnished 65 to 75 percent of the pre-war imports, but during World War II Bolivia and Argentina have supplied important amounts.

Substantially all our export trade in tungsten products is the result of free entry of ores for treatment. Some tungsten is exported in other manufactured products, with benefit of draw-back.

The war demand not only greatly stimulated domestic mine production, but also increased output in Latin America. Prices² averaged \$1.60 per pound for the period 1941-43, compared with \$1.34 in the period 1937-40 and \$0.75 in the period 1926-29. During the war imports increased nearly as rapidly as domestic production, and large stocks were accumulated. By October 1944 the Government stock pile contained 16,856 tons, or an equivalent of 3 years' consumption at the 1940 rate. The entire United States war industry was greatly "tooled up," and there is now a very large supply of cutting tools. The following analysis is based on the assumption that the Government stock pile will be maintained and kept off the market.

² These calculated prices are based on average United States market quotations for unit of WO₃ (tungsten trioxide).

POST-WAR SHORT TERM

In this period steel ingot output is likely to total about 80 million tons annually,² which would indicate a consumption of tungsten of 5,500 to 6,500 tons, a marked increase over 1940. Owing to the probable excess world-mine capacity, prices of tungsten may decline greatly, even to a figure well below that which prevailed in 1940. The price decline would not materially affect the quantity of tungsten consumed. Because of the price decline, however, domestic mine output of tungsten would probably decrease markedly, though perhaps at a slower rate than prices, and toward the end of the short-term period production might be very much less than in 1940. Imports would probably decline from the recent level but remain above that of 1940.

POST-WAR LONG TERM**Consumption, Production, and Imports**

Although changes in United States import duty would have a material effect on the demand for foreign-produced tungsten and therefore might affect the price thereof, no basis exists for evaluating the probable changes in price. The values of imports given in the following discussion are based on the assumption of constant foreign prices under the respective income levels, regardless of the rate of the United States duty. Imports for processing in bond and export are referred to under the section on exports.

Per capita income at 1939 level.

At this income level the production of steel, taking account of increase in population, would probably be about 50-60 million tons,³ and the consumption of tungsten about 4,000-4,500 tons, a decrease below 1940. Because of the large supply of high-grade foreign ore, especially in the Far East, the world price might be somewhat below the level of 1940, possibly as much as 15 percent lower, which would be about 70 cents per pound.

Duty as in 1939.—Assuming a corresponding domestic mine value of about \$1.20 per pound for tungsten, domestic production might be 1,500 to 2,000 tons, with a mine value of approximately 3.7-4.8 million dollars. Imports might be 2,500-3,000 tons (about the same share of consumption as in 1940), with a foreign value of 3.9-4.2 million dollars.

Duty reduced by 50 percent.—With the import duty reduced by 25 cents per pound and assuming that domestic producers would have to lower their price correspondingly, the domestic mine value of tungsten might decline to about 95 cents per pound. Because much of the ore mined in this country is of relatively low grade, at this price level domestic producers would be unable to maintain their former share of consumption. Thus domestic production might decline to 700-1,200 tons, valued at 1.3-2.3 million dollars. Imports might become about three-fourths of the consumption, totaling 3,200-3,800 tons, with a foreign value of 4.5-5.3 million dollars.

Duty increased by 50 percent.—A 75-cent per pound import duty would probably result in a domestic mine value of about \$1.45 per pound, and the high prices in the United States might result in some

² See section on iron and steel in this series.

decrease in the consumption of tungsten, particularly in uses where there can be a substitution of molybdenum, which is relatively abundant from domestic sources. Imports might decrease to 1,500–2,000 tons, having a foreign value of 2.1–2.8 million dollars, and domestic production might be 2,000–2,500 tons, having a mine value of 5.8–7.2 million dollars, the higher price permitting the mining of lower-grade deposits.

Per capita income 75 percent higher than in 1939.

At this income level steel production would probably be about 90 million tons,⁴ and the consumption of tungsten in the United States would therefore be about 6,500–7,500 tons. The increased demand for tungsten would cause an increase in the world price, possibly to \$1 per pound.

Duty as in 1939.—With a corresponding domestic mine value of \$1.50 or slightly more, production of tungsten might amount to 2,300 to 2,800 tons, having a mine value of 6.9–8.4 million dollars, and imports might be 4,000–4,800 tons, having a foreign value of 8.0–9.6 million dollars.

Duty reduced by 50 percent.—A duty of 25 cents per pound might result in a domestic mine value of about \$1.25 per pound. Domestic production might be around 1,600 to 2,200 tons, valued at 4.0–5.5 million dollars, and imports might be as high as 4,800–5,500 tons, having a foreign value of 9.6–11.0 million dollars.

Duty increased by 50 percent.—The high domestic prices that would probably result from this increased duty would tend to promote the substitution of molybdenum for tungsten, as well as economies in the use of tungsten, and as a result the total consumption of tungsten might be reduced by as much as 500 tons as compared with consumption at an unchanged duty. Domestic production might be around 2,500–3,500 tons, valued at 8.7–12.2 million dollars, and imports might be 3,000–4,000 tons, having a foreign value of 6–8 million dollars.

Exports

Future exports are likely to consist of metal or advanced tungsten products, such as tools, made from imported ores on which either the free-in-bond or draw-back regulations apply. It is unlikely that any domestic tungsten will be exported owing to the higher domestic price. The extent of bonded exports or those under draw-back cannot be forecast.

Employment

Employment in United States tungsten mines, based on information from the United States Bureau of Mines, is estimated to have been 700 in 1940, but increased rapidly to 1,400 in 1943, the peak employment period. Under the various assumptions regarding production indicated above, the number of employees might be about 200–1,000 people.

⁴ See section on iron and steel in this series.

FERROMANGANESE

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem 1939
	Ferromanganese grades (30% or more manganese):		
302 (a).....	Containing not over 1% carbon.	1½¢ per lb. + 15% ad valorem.	44.8%
302 (d).....	Containing over 1% and less than 4% carbon.	1½¢ per lb.....	35.0%
302 (d).....	Containing not less than 4% carbon.	1¢ per lb.....	32.0%
	Average.....		35%

NOTE.—The Tariff Act of 1930 rate on ferromanganese containing more than 1 percent of carbon was 1¼ cents per pound. The rate on ferromanganese containing 1 percent or more of carbon was reduced to the equivalent of 1 cent per pound pursuant to the first Canadian trade agreement, effective January 1, 1934, and the reduced rate was continued pursuant to the second Canadian agreement, effective January 1, 1939.

GENERAL

Data on United States production, imports, and consumption of all three grades combined for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (long tons).....	270,111	41,237	311,338	Percent 13
Value (\$1,000).....	28,100	2,935		
Average unit value.....	\$95.83	\$71.19		
Persons employed (number).....	1,200			

¹ Exports not separately classified. A total of 2,929 long tons of ferromanganese and spiegeleisen valued at \$267,798 was exported in 1939.

² Foreign value.

³ The three grades of ferromanganese differ widely in unit values.

Ferromanganese, an alloy of iron and manganese containing 78 to 82 percent manganese, is used principally in the manufacture of low-carbon steel in the open-hearth furnace. There is relatively little substitution of other products for ferromanganese.

In normal times, domestic production of ferromanganese, manufactured mainly from imported ores, supplies around 90 percent of requirements. Norway, France, the Netherlands, Czechoslovakia, Yugoslavia, and Japan have been the principal sources of United States imports.

The United States is dependent upon imports of manganese, either alloy or ore, for most of its requirements. On the basis of quantity, imports of ferromanganese containing not less than 4 percent carbon are usually twice as large as those of the other two grades combined, and in 1939 accounted for 63 percent of the total imports. Demand is determined by activity in the steel industry. A 50-percent change in tariff treatment would not materially affect the over-all quantity of manganese imported or of ferromanganese consumed. No change in duties which applies equally to ore and alloy would alter the relative proportions in which they are imported.

The Government stock pile of ferromanganese is small in comparison with the average annual consumption and a rapid disposal of this

reserve after the war would have little effect upon the domestic industry. At the beginning of 1945, the stock pile of manganese ore was equal to about 8 months' wartime consumption.

POST-WAR SHORT TERM

The operating rate of the steel industry during this period may require 625,000 long tons of ferromanganese annually. Owing to the rehabilitation necessary in the countries which formerly were the principal sources of imports, Norway may remain the only source; how much would be imported is problematical.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

On the basis of a steel production of 55-60 million tons,¹ about 340,000 long tons of ferromanganese would be required, or almost 10 percent more than in 1939. Imports may be 10 percent of consumption (the average percentage for the period 1936-39), or 34,000 long tons, with a foreign value (at average unit prices as in 1939) of about 2.4 million dollars. Domestic production might approximate about 306,000 long tons, valued at perhaps 26.2 million dollars. The consumption, and the ratio of imports to production, would probably not be affected appreciably by 50-percent changes in the rates of duty.

Per capita income 75 percent higher than in 1939.

At this level of income, steel production may be nearly double that of 1939, or about 90-95 million tons. Annual consumption of ferromanganese may then reach 550,000 long tons, or about 60 percent more than with income as in 1939. The share supplied by imports would probably be about the same as under the lower income level; they may amount to about 55,000 tons annually, with a foreign value of about 4.5 million dollars. Domestic production would then be 495,000 tons, valued at about 48 million dollars. This assumes an increase of about 15 percent in the prices.

Exports

It appears unlikely that the United States will export significant quantities of this product.

Employment

Total employment in this industry in 1939 amounted to only 1,200 men. With maximum production at the higher income level, employment might reach 2,500.

FERROSILICON

Tariff paragraph: 302 (i).

Commodity: Ferrosilicon (8-30 percent silicon).

Rate of duty: 1 cent per pound of contained silicon. *Equivalent ad valorem (1939):* 10 percent.

NOTE.—The rate fixed in the Tariff Act of 1930 on ferrosilicon containing 8 to 60 percent silicon was 2 cents per pound on the silicon content. Pursuant to the first trade agreement with Canada, effective January 1, 1936, the duty on ferrosilicon of 8 to 30 percent silicon content was reduced to 1½ cents per pound of silicon content, and pursuant to the second Canadian agreement, effective January 1, 1939, the rate was further reduced to 1 cent per pound.

¹ See section in this series on iron and steel.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export			
Quantity (1,000 long tons gross weight).....	344	(1)	8	352	Percent
Value (\$1,000).....	16,850	(1)	1,236		
Unit value per long ton ²	\$49	(1)	\$28.96		

¹ Not available, but known, to be very small.

² Foreign value.

³ A average unit value has little meaning because of the wide divergence of grades and prices.

Ferrosilicon is an alloy used largely in the foundry to deoxidize molten iron and steel. It is also used as an alloy in certain iron and steel castings. During the war ferrosilicon has been used to reduce magnesium in the Pidgeon process. In recent years crushed and sized ferrosilicon has been used in the new sink-and-float method of ore concentration. For many of its uses as a deoxidizer, substitutes such as silico-manganese or silico-spiegel, and calcium silicide are available. Ferrosilicon is made in electric or blast furnaces. The cost of electric power is an important item in the former method. United States production in the pre-war period ranged from 160,000 to 400,000 long tons yearly. Imports, mostly from Canada, ranged from 4,000 to 13,000 tons.

The movement of the high-silicon grades is somewhat restricted by maritime safety regulations, as they are chemically active under certain conditions. In the lower grade, freight is a considerable item of cost, as prices are relatively low. The main producers in Canada and Europe exporting to the United States are financially associated with the principal domestic maker of the high grades of electric furnace product. The availability of low-cost electric power probably determined to some extent the importation of the high grades from Canada. Norway has been the most important European supplier in the past. It is likely that the producing plant there has been damaged or destroyed during hostilities. The United States capacity is probably larger than peacetime requirements. Exports are not recorded separately, but were probably very small and possibly destined for nearby areas in Canada.

The United States is the world's largest market for ferrosilicon. European cartel producers have been at a disadvantage in selling in this market by reason of transportation costs and shipping restrictions. In spite of the relatively low rate of duty, there have been no significant imports for the past 10 years or more. It would, therefore, appear that changes in duty of 50 percent in either direction would not greatly change our trade position in ferrosilicon.

POST-WAR SHORT TERM

Consumption of ferrosilicon is closely related to the activity of the steel industry. With a high level of national income, an increase over the 1939 figure of perhaps one-third in quantities consumed and

produced might be anticipated. There is little reason to believe that imports will furnish more than 2 to 5 percent of domestic consumption; and would probably be from Canadian plants near our steel-making areas.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Future consumption of ferrosilicon will be related to the level of steel¹ output. At this level of income domestic production might be about 390,000 tons valued (at the 1939 price) at about 19.5 million dollars. Imports might be about 9,000 tons, with a foreign value of roughly \$260,000.

Per capita income 75 percent higher than in 1939.

Domestic production would probably be about 590,000 tons, valued at a price about 10 percent higher than in 1939, or 32½ million dollars. Imports under this high level of demand might be 13,500 tons, with a foreign value of about \$435,000.

Exports

There is no reason to expect any change in our insignificant export trade.

Employment

Employment is small, but cannot be estimated, as most of the plants make many products with the same crew.

FERROSILICON ALUMINUM, FERROALUMINUM SILICON, AND ALSIMIN

Tariff paragraph: 302 (j).

Commodity: Ferrosilicon aluminum,
ferroaluminum silicon,
and alsimin.

Rate of duty: 1¼ cents per lb.

Equivalent ad valorem (1939): 13%.

NOTE.—This report covers the commodities named above only where they contain 20 to 52 percent aluminum, with silicon and iron as the other principal component elements. The Tariff Act of 1930 imposed a duty of 5 cents per pound on all ferrosilicon aluminum, ferroaluminum silicon, and alsimin. By Presidential proclamation under section 336 of the tariff act, the rate on those commodities containing 20 to 52 percent aluminum was reduced to 2¼ cents per pound, effective July 18, 1933. A further reduction to 1¼ cents per pound was made on February 15, 1936, pursuant to trade agreement with Switzerland.

GENERAL

Data on United States imports for 1939 are given below:

Quantity (1,000 pounds).....	1, 268
Value (\$1,000).....	1 122
Unit value (cents per pound).....	9. 6

¹ Foreign value.

The alloys of aluminum and silicon in this class are used principally in foundries as deoxidizers for molten steel and for the purpose of adding aluminum, silicon, or iron to certain alloys; the quantity used per ton of steel is very small. There are several competitive deoxidizers which serve much the same general purpose; in fact, this particular

¹ See section on iron and steel in this series.

group of deoxidizers forms only a very small portion of the total volume used in steel and nonferrous alloys, although they are relatively important in a small number of special foundries.

There are no statistical data on the production, consumption, or exports. It is known that several concerns in the United States are equipped to produce these alloys. Most of the production is by secondary smelters which handle aluminum scrap. It is estimated that during the war only about 100,000 pounds of this type of alloy were being produced annually in the United States. Since there were no imports, this figure represents wartime consumption.

Switzerland has been the sole source of imports in the past; they have been the product of a single concern specializing in making other aluminum alloys. No exports of alloys in this group are known to have been made in recent years.

When the duty was reduced from 2½ to 1½ cents per pound in 1936, imports increased about fivefold in the succeeding year. This increase, however, was due at least in part to increased usage at that time in special castings which would probably have occurred in any case. (Recently there has been a greater economy in usage of these oxidizers.) The continued lowering of the foreign value since 1936 may indicate a high degree of competition with the domestic production of the same or substitute deoxidizers. Apparently the United States was the only export market for the Swiss product. A 50-percent increase or decrease in the duty would probably not be an important factor in determining the volume of post-war imports.

POST-WAR SHORT TERM

Imports are likely to be very small because of the abundance of low-priced aluminum scrap that can serve as an oxidizer.

POST-WAR LONG TERM

Consumption, Production, and Imports

It appears likely that our producing capacity and supply will be much greater after the war. Consumption will probably be much higher with a national income 75 percent higher than in 1939, than with an unchanged income.

Per capita income at 1939 level.

The future import trade is very uncertain but it seems likely that less than 500,000 pounds of this alloy, with a foreign value of \$50,000, would seek the United States market.

Per capita income 75 percent higher than in 1939.

Even at this income level, imports might be less than 1 million pounds, with a foreign value of about \$120,000.

Exports

There is no reason to expect an export trade in these alloys.

Employment

The production of these aluminum-silicon alloys in the United States is carried on in conjunction with the secondary smelting and foundry industries and for this reason no employment figures are available. The number of men involved is probably very small.

CALCIUM SILICIDE

Tariff paragraph: 302 (n).
 Commodity: Calcium silicide (calcium silicon).
 Rate of duty: 25% ad val.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	3,973
Value (\$1,000).....	1,225
Unit value (per pound).....	\$0.056

¹ Foreign value.

Calcium silicide is used in the United States to a limited extent in deoxidizing and cleansing molten iron and steel from which special castings are made, and also as a deoxidizer and cleanser in the manufacture of certain nonferrous alloys. This product is competitive with other deoxidizers, although its price during the war (13 to 14 cents per pound) is higher than some of the competitive materials.

In the United States there is only one producer, which began operation late in 1939, when shipments from Europe were discontinued as a result of the war. Before 1939, the entire United States supply of calcium silicide came from Europe, approximately three-fourths from a plant in Norway which is owned by the one United States concern now producing the product in this country. Exact data on United States production and consumption are not available, but domestic output has probably averaged about 4,000 tons annually during the war. Domestic production of calcium silicide and other deoxidizers is in the Great Lakes industrial area, an important center of the electrochemical industry. Power, the principal item of production cost, is probably higher in the Great Lakes area than in Norway. The domestic producer, however, has facilities for the production of calcium silicide on the Pacific Coast, where power is cheaper than in the Great Lakes area and may be cheaper than in Norway. These Pacific Coast facilities can be used for the production of calcium silicide after the war.

POST-WAR SHORT TERM

Consumption will probably be considerably less than it has been during the war. Imports are likely to be small, as it will take some time in Norway and other foreign sources to reestablish production for export.

POST-WAR LONG TERM

Consumption, Production, and Imports

Imports of calcium silicide will depend very largely on the policy followed by the one domestic producer, who also owns the plant in Norway that supplied most of the pre-war imports. The policy of this producer will probably be determined largely by the rate of duty on this product. If the duty is not changed, the domestic producer might find it to his interest to continue to produce substantial quantities of calcium silicide in the United States, and at the same time import from his plant in Norway. If the duty were decreased by 50

percent, it is possible that the concern would find it advantageous to discontinue production in the United States and to import large quantities from Norway. On the other hand, if the duty were increased by 50 percent, it is likely that the producer would operate the plant in the United States and discontinue imports from Norway. It should be noted that although Norway was the principal pre-war source of United States imports of calcium silicide, supplying about three-fourths of the total, significant quantities were also imported from other sources.

Per capita income at 1939 level.

Consumption might be about 10 percent greater than in 1939 and amount to around 4.5 million pounds. Prices would probably be about the same as in 1939 if the duty were unchanged, but would be affected by duty changes.

Duty as in 1939.—Imports might amount to about 2.3 million pounds with a foreign value of about \$130,000 (5.6 cents per pound). Domestic production would thus be about 2.2 million pounds valued at \$240,000 (11 cents per pound).

Duty reduced by 50 percent.—Domestic production might be discontinued, in which case imports would supply all the domestic market and amount to about 4.5 million pounds, with a foreign value of about \$285,000 (6.3 cents per pound).

Duty increased by 50 percent.—Imports from Norway might cease entirely, but there would probably be some imports from other foreign sources. Imports thus might amount to 100,000 pounds, with a foreign value of \$50,000 (4.9 cents per pound). Domestic production might amount to 4.4 million pounds, valued at \$530,000 (12 cents per pound).

Per capita income 75 percent higher than in 1939.

Consumption might be one-third larger than with income as in 1939 and amount to 6.0 million pounds. Prices would be appreciably higher than at the lower level of income.

Duty as in 1939.—Imports might amount to around 3.0 million pounds, with a foreign value of \$190,000 (6.33 cents per pound) and domestic production might amount to 3.0 million pounds, valued at \$360,000 (12 cents per pound).

Duty reduced by 50 percent.—Imports might supply all the domestic market and would thus amount to 6.0 million pounds, with a foreign value of \$420,000 (6.9 cents per pound).

Duty increased by 50 percent.—Imports might amount to 200,000 pounds, with a foreign value of \$11,000 (5.6 cents per pound). Domestic production would then amount to about 5.8 million pounds, valued at about \$755,000 (13 cents per pound).

Exports

United States exports of calcium silicide after the war will probably be negligible.

Employment

Employment in calcium silicide production is believed to be very small; thus the changes indicated in this report would result in insignificant shifts in employment.

IRON AND STEEL PRODUCTS¹

Tariff paragraph: 303-328, 1800.

Comodities: Iron and steel products.

Rates of duty: Various.

Equivalent ad valorem (1939): 20% (approximate average).

NOTE.—These products embrace more than 300 import classes covering plain, alloy, and other grades of iron and steel products. The average equivalent ad valorem of most of the rates ranged between 10 and 25 percent.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production (rolled products)			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 short tons).....	39,068	2,593	36,475	192	36,667	Percent 0.5
Value (\$1,000).....	2,720,000	176,828	2,544,000	18,009		
Unit value (per ton).....	\$70.00	\$68.00	\$70.00	\$68.00		
Persons employed in steel works, rolling mills, and foundries.....	491,949					

¹ Value of steel works and rolling-mill products as reported by the U. S. Bureau of the Census. There is considerable duplication.

² Foreign value.

Because of the many grades and classes involved, the present report primarily covers iron and steel products as a single group. It also includes considerable discussion of individual products. In summary tables, such as that shown above, the scope of the statistics of imports and exports is somewhat more inclusive than that of the statistics of production. Imports and exports consist chiefly of rolled products, but also include relatively small quantities of cast and forged products. On the other hand, the statistics of production refer only to rolled products, because complete data respecting the output of cast and forged products are not available. Thus, the statistics of production, exports, imports, and consumption are only roughly comparable. The figures for production and consumption involve considerable duplications.

War conditions reduced imports to an abnormally low point in 1939 (about 30 percent less in quantity and 20 percent less in value than in 1936-38). For that reason, statistical comparisons of production, exports, imports, and consumption for a more representative pre-war period (1936-38 average) are shown below:

Item	Production (rolled products)			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 short tons).....	34,202	2,096	32,106	273	32,379	Percent 0.8
Value (\$1,000).....	2,390,000	131,277	2,259,000	16,077		
Unit value (per ton).....	\$70.00	\$63.00	\$70.00	\$59.00		

¹ Foreign value.

² Based on census data and average quoted prices of finished steel. The latter were at approximately the same level in 1936-38 as in 1939.

³ Excludes iron ore, pig iron, and iron and steel scrap, which are described in other sections

Steel is cheaper and stronger than most of the competing materials, and is made in many forms and grades for innumerable uses. Iron and steel represent (by weight) about 95 percent of the production and consumption of all metallic products. Enormous quantities of basic raw materials—iron ore, coal, and limestone—are required by the industry, especially in periods of peak production. It also requires considerable quantities of accessory materials, such as manganese, chromium, tin, refractories, and many others. In fact, for many of these materials the industry is the principal consumer, so that the rate of steel production determines in large measure the rate of consumption of the accessory materials, and hence the rate of production, imports, or both. Many of these accessory materials are discussed in other sections in this series.

During the war, United States steel-making capacity, which limits the effective output of rolling and other finishing facilities, has been increased about one-sixth above pre-war levels. Annual steel ingot capacity now amounts to about 95 million tons, equivalent to about 65 million tons of rolled products after scrap losses and uses in other than rolled forms. The industry now has the greatest capacity in its history, and most of its facilities are more modern and efficient than ever before. However, some of the marginal facilities both for steel making and for rolling, representing about 5 percent of the over-all capacity, may be scrapped or held in stand-by condition after the war because they may not be able to compete in a post-war economy. On the whole, the iron and steel industry will have no great difficulty in converting to peacetime production. The operating rate and employment will depend more on income levels than on any other factor.

The United States has been a net exporter of iron and steel products for many years. Before the war, imports supplied less than 1 percent of our consumption, whereas from 3 to 7 percent of the output was exported. Germany, Belgium-Luxemburg, and France were the principal sources of imported low-priced tonnage steels, and Sweden and the United Kingdom of the imported higher-priced special steels. To a considerable extent the special steels, especially those from Sweden, may be regarded as supplemental to rather than competitive with the domestic product. Many of these items sell on a prestige basis, and many of the individual transactions are too small to be of interest to United States producers. Because of the cost of rail transportation in the United States, the market for imported tonnage steels is limited to areas near the ports of entry. Higher-priced steels are much more widely distributed, but the over-all consumption is but a small fraction of that of tonnage steels.

Except for barbed wire, which is free of duty (tariff paragraph 1800), practically all of the iron and steel products covered by this section are dutiable under paragraphs 303-328. The basic and additional rates of duty (for alloy content and advanced processing) for the entire group averaged about 20 percent in equivalent ad valorem in 1939, most of the duties in the various brackets ranging from about 10 to 35 percent. Some of the rates were reduced pursuant to the Trade Agreements Act of 1934, but nearly all of the reductions were made before mid-1939.

The United States is on an export basis for tonnage steel, but on an import basis for special steels of the kinds imported from Sweden

and the United Kingdom. Before the war, United States exports were widely distributed. Canada was usually the principal market, with Japan, Mexico, Brazil, the Philippine Islands, and the Soviet Union ranking high among our foreign outlets. In the export of iron and steel products as such, however, the United States was surpassed by Germany, Belgium-Luxemburg, France, and the United Kingdom, chiefly because of lower wage rates in those countries or because of tariff advantages, such as those enjoyed by the United Kingdom in British Empire markets.

The preceding general statistical comparisons of iron and steel products as a single group are supplemented by the table below. The competitive position of the many branches of the industry varies considerably. The table shows the production, exports, imports, and consumption of the six leading products or groups of related products in import trade in 1939 (foreign value basis), together with an "all other" column. It also shows the average equivalent ad valorem of the duties on the several groups. Barbed wire has been on the free list for many years; the average equivalent ad valorem for the other selected groups ranged from 11 percent (for wire rods) to 26 percent (for seamless tubes).

In terms of foreign value, the aggregate imports of the selected products represent 64 percent of the total imports of rolled, forged, and cast products in 1939. Except for barbed wire, imports accounted for less than 2 percent (in most cases less than 1 percent) of the consumption of the products or groups listed in the table. For practically all tonnage-steel products, imports were greatly exceeded in volume by exports. For some specialties not shown separately in the table, the ratio of imports to consumption is much higher than for these groups.

Selected iron and steel products: United States production, exports, imports, and consumption of leading imports, 1939

Item	Seamless tubes ¹	Strips	Structural shapes	Steel bars ²	Wire rods	Barbed wire	All other	Total
Quantity (1,000 short tons)								
Production.....	1,735	1,827	3,359	4,872	3,680	230	23,365	30,068
Exports.....	123	100	171	180	35	160	1,924	2,593
Imports.....	29	4	44	21	12	17	65	192
Apparent consumption.....	1,641	1,731	3,232	4,713	3,657	187	21,508	36,667
Value (\$1,000)								
Exports.....	13,296	6,553	9,055	12,897	1,330	3,744	129,453	176,328
Imports.....	2,301	1,728	1,331	1,106	929	927	4,687	13,009
Unit value (per short ton)								
Exports.....	\$108	\$66	\$53	\$72	\$38	\$62	\$67	\$68
Imports.....	79	490	30	54	78	54	72	68
Average equivalent ad valorem (percent)								
Duty.....	26	18	13	25	11	Free	22	20
Ratio (percent) based on quantity								
Imports to consumption.....	1.8	0.2	1.4	0.4	0.3	9.1	0.3	0.5
Exports to production.....	7.1	5.5	5.1	3.7	1.0	25.1	8.2	8.6

¹ Includes ball-bearing tubes. — ² Excludes concrete reinforcement bars.

³ Foreign value.

A discussion of each of the selected groups of products follows:

Seamless tubes.—In terms of foreign value, seamless tubes were imported to a greater extent than any other iron and steel product. Nevertheless, imports supplied only 1.8 percent of consumption in quantity, and were considerably less than exports. The bulk of the imports consisted of carbon steel tubes, chiefly for use in oil fields. In 1939, imports of alloy steel ball-bearing tubes represented about 9 percent of the quantity and 18 percent of the value of imports of all seamless tubes. In some years imports of ball-bearing tubes have supplied about one-third of consumption, coming chiefly from Sweden and Germany. A large domestic ball-bearing producer controlled by Swedish interests accounted for most of the imports, and normally obtained the bulk of its supplies of these tubes from the parent plant in Sweden.

Strips.—Imports of strips of all grades are small in quantity in comparison with production and exports. Imports consist largely of high-priced razor blade strip, whereas production and exports are chiefly of low-priced grades such as are used by the automotive industry. Trade reports indicate that before the war, imports of razor blade strip not over 6/1,000 inch in thickness supplied more than one-half of consumption. They came largely from Sweden, and many consumers preferred the imported product because of its high quality.

Structural shapes.—Pre-war imports consisted almost entirely of low-priced unfabricated grades. They supplied 1.4 percent of consumption in 1939 in quantity, and were greatly exceeded by exports. Imports came chiefly from continental Europe (Germany, France, and Belgium-Luxemburg) and were sold on a price rather than a quality basis. Because of transportation costs, consumption of the imported material was restricted to seaboard markets.

Steel bars.—Imports consisted largely of low-priced grades from Belgium-Luxemburg, France, and Germany. Higher-priced tool steel bars came chiefly from Sweden and the United Kingdom. Imports supplied only a small fraction of 1 percent of the consumption of tonnage steel bars, but about 10 percent of the relatively small consumption of tool steel bars. The United States was decidedly on an export basis for tonnage steel bars, but on an import basis for tool steel bars. Most of the latter were sold in our markets on a prestige basis.

Wire rods.—Most of the imports consisted of high-priced grades, largely from Sweden, whereas most of the production and exports consisted of low-priced grades. Many consumers preferred the imported product because of its high quality, and to a considerable extent imports may be regarded as supplemental to rather than competitive with the domestic product. Exports exceeded imports both in quantity and value.

Barbed wire.—Imports of barbed wire (duty-free) supplied about 9 percent of consumption in 1939. They came chiefly from Germany and Belgium-Luxemburg. They were sold on a price rather than a quality basis, and to a large extent were distributed by mail-order houses. The domestic product is of higher quality, and exports exceeded imports by a considerable margin.

All other iron and steel products.—This miscellaneous group represented in 1939 only about one-third of the imports, in quantity, but nearly three-fifths of the domestic production. Considered as a single group, imports accounted for 0.3 percent of consumption in

1939. The large United States consumption of plates, sheets, rails, welded pipe, tin plate, and concrete reinforcement bars, which are the principal products in this category (based on quantities consumed), is almost entirely supplied by the domestic industry.

Imports of several of these products, however, exceeded \$100,000 in active pre-war years. The principal products imported (in terms of foreign value) include low-priced tonnage steel items, such as hoops and bands, concrete reinforcement bars, rails (chiefly light rails), and higher-priced specialties such as wire and wire rope and strand. Imports of high-priced wire came largely from Sweden and to some extent may be regarded as supplemental to the domestic output.

POST-WAR SHORT TERM

It seems likely that the deferred civilian demand both here and abroad, will be sufficiently large, at high income levels, to maintain steel production and consumption at high levels for several years after the war, though probably somewhat below the wartime peak. Some of the marginal facilities may be scrapped or held in a stand-by condition.

During this period, it is probable that imports will be considerably below average pre-war levels, chiefly because European countries, especially on the Continent, will have much less iron and steel available for shipment overseas. As a result of the war, the over-all production of iron and steel in Europe may fall below pre-war levels, especially in Germany, and more of the output will be required for reconstruction in devastated areas. Sweden and the United Kingdom may be able to resume normal shipments to the United States more promptly than other European countries.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of iron and steel products may be somewhat above the 1939 level, chiefly because of the growth of population. In view of the influence of other economic factors, favorable and unfavorable, which it is impossible to foresee, consumption may be estimated at 38-43 million tons, or 5-15 percent higher than in 1939. The production of steel ingots may be about 55-60 million tons, equivalent after scrap losses to about 40-45 million tons of rolled products. Capacity operations seem unlikely, at this assumed level of income, because backlogs of civilian demand will no doubt have been made up by these later years.

It is probable that changes in the rates of duty within the limit specified would have only insignificant effect on over-all domestic consumption, production, or price levels, in view of the fact that imports normally supply less than 1 percent of the consumption. Production of rolled products for the domestic market might total 37.7-42.9 million tons, valued at 2,640-3,000 million dollars (\$70 per ton, the 1939 average). With the duties as in 1939, the average unit value of imports would probably not vary appreciably from the 1939 level of \$68 per ton. Changes of 50 percent in the duties, in either direction, might result in shifts in the composition of imports from higher to lower grades, or vice versa, and thus lower or raise the

average unit values, even if prices of the grades individually remained unchanged. The causal factors which may affect the composition of imports are, however, so complex that it is impossible to forecast such changes in average unit values, and they are therefore here disregarded.

Duties as in 1939.—Imports may be about 200,000–250,000 tons, with a value of 14–17 million dollars. These quantities and values are considerably greater than the abnormally low figures of 1939, but are less than the averages for the period 1936–38. Although it seems likely that foreign countries will, in the long-term post-war period, have larger quantities available for export to the United States than in the years immediately after the war, it seems doubtful whether they can export as much as in normal pre-war years. Recovery from the devastation which the continental European steel industry, especially that of Germany, has suffered during the war, will probably not be complete during the earlier part of the 1950 decade. Moreover, the abnormal demands for steel for general reconstruction on the European continent will probably not yet have been fully met. It is possible also that the activity of the German steel industry may be restricted by action of the United Nations.

Duties reduced by 50 percent.—This might result in imports about one-fifth larger than with no change in duty. Imports may be about 250,000–300,000 tons, valued at 17–20 million dollars, taking the unit value at the 1939 level. There is only a limited domestic market for high-grade tool and fine steels of the Swedish type, so that imports from that source are not likely to be greatly affected by reductions in rates of duty within the limit stipulated. Imports of tonnage steels might increase somewhat, since they could be marketed farther inland, but the quality is somewhat inferior to that of the domestic product, and imported steels are generally not available in all of the sizes and grades required.

Duties increased by 50 percent.—Imports might be about one-fourth less than with unchanged duties and might be about 150,000–200,000 tons, valued at 10–14 million dollars, assuming the same unit value as in 1939. The imports of tonnage steels would probably decline more than those of special steels, because price considerations are of greater importance to consumers of low-grade steels.

Per capita income 75 percent higher than in 1939.

At this income level, the demand for producer and consumer capital goods may be so great as to result in production of iron and steel at rates equaling or even exceeding wartime levels. The production of steel ingots amounted to nearly 90 million tons in 1944, and might reach 90–95 million tons in the long-term period, equivalent after scrap losses to 63–68 million tons of rolled products (60–75 percent higher than in 1939). The presumption is that under these conditions additional steel-making capacity will have been constructed. Because of the excess of exports over imports, consumption may be 60–65 million tons, or 65–75 percent higher than in 1939.

It seems likely that changes in the rates of duty within the 50-percent limit stipulated would have little effect on domestic consumption or production levels. Irrespective of these duty changes, production of rolled products for the domestic market might total 59.5–64.8 million tons, valued at 4,760–5,180 million dollars; the average unit value is here assumed to be about \$80 per ton, or 10–15

percent higher than in 1939. It is assumed that imports would be valued at \$75 per ton, compared with \$68 in 1939, regardless of duty changes. These estimated increases in domestic and foreign prices are more or less in line with anticipated increases in general price levels. As already stated, duty changes might affect the composition, and hence the average unit value, of imports.

Duties as in 1939.—Imports might be about the same proportion of consumption as at the lower income level; they might total about 300,000–400,000 tons, valued at 23–30 million dollars, exceeding the average annual imports of 1936–38, but below the peak level of 1929.

Duties reduced by 50 percent.—This might result in imports of about 400,000–500,000 tons, valued at 30–38 million dollars.

Duties increased by 50 percent.—Under these conditions, imports might be about 200,000–300,000 tons, valued at 15–23 million dollars. Because of the cost of transportation, the marketing of foreign tonnage steel products would be more closely restricted to areas near the ports of entry than if lower duties prevailed.

Exports

The long-term prospects of the United States in export trade in iron and steel products will probably depend more on world-income levels than on any other factor. But the ability of the domestic industry to compete in export markets may also be affected by other considerations, such as relative foreign and domestic costs and prices, cartel policies, the level of foreign tariff, and other trade restrictions, and possible controls by the United Nations over the iron and steel industries of Germany and Japan.

The growth of the iron and steel industries of Canada, Brazil, Mexico, and other smaller producing countries may not have any adverse effect on the United States iron and steel industry. Most of these countries will not be able to produce a full line of products, and will probably still be dependent on the United States for tin plate and other specialties in which this country has certain competitive advantages. Furthermore, as foreign industrialization increases and the standard of living is raised, there may be an increased demand for American industrial machinery, automobiles, and other manufactures of which steel is the main component.

With world income about the same as in 1939, United States exports may be 2–3 million tons, valued at 140–200 million dollars, or from about 25 percent below the 1939 level in quantity and value to 15 percent above that level. United States export trade in 1939 (2,593,000 tons, valued at 176 million dollars) was abnormally large because of war conditions. In 1936–38 exports amounted to 2,096,000 tons, valued at 131 million dollars.

With a world income 75 percent higher than in 1939, it is conceivable that United States exports may exceed previous peacetime peaks. They may be 3–4 million tons, valued at 225–300 million dollars, thus increasing 15–55 percent in quantity and 30–70 percent in value above the level of 1939.

The estimates given above have been made on the assumption that foreign tariffs would remain at the same level as in 1939. Our trade would benefit from decreases in foreign trade restrictions, and conversely would suffer from increases. The trade would also be affected by international cartel policies.

Before the war, the International Steel Cartel and its syndicates controlled about five-sixths of the world trade in iron and steel, and to some extent rendered foreign tariff barriers ineffective. The members of the international cartels and syndicates included producers in Germany (including the Saar), France, Belgium, Luxemburg, Czechoslovakia, Austria, Hungary, the United Kingdom, and Poland. Through the former Steel Export Association of America, the principal producers in the United States were represented in the rail and tinplate cartels, and had previously been represented in the tube cartel, which collapsed in 1935. Producers in the Soviet Union, Japan, and Sweden were not members of any of the cartels or syndicates. The Soviet Union and Japan were important producers, but were not influential in export trade. Sweden was a small producer, and exported only high-grade special steels, which were not competitive with the tonnage steels controlled by the cartels.

The cartels assigned global export quotas to the producers in each of the exporting countries, and the sales syndicates maintained control over export prices. Prices were quoted f. o. b. European ports, but it was sometimes necessary to make price concessions in certain markets because of competition from outside producers. In general, it may be assumed that prices were more stable than those which would have prevailed if there had been unlimited competition. It is difficult to foresee the post-war position of these cartels and syndicates, but it seems possible that they may be less influential than before the war,—

— Employment

According to statistics of the Bureau of the Census, 491,949 persons were employed in steel works, rolling mills, and foundries in 1939. Since that time, many larger and more efficient production facilities have been constructed. It is probable that in the long run, the number of workers required to produce an equivalent tonnage of iron and steel products will decline. Wage rates may continue at high levels, and there will be a strong incentive towards further mechanization.

WIRE ROPE AND STRAND

<i>Tariff paragraph</i>	<i>Commodity</i>	<i>Rate of duty</i>	<i>Equivalent ad valorem (1939)</i>
316 (a)-----	Wire rope and strand:		
	Rope-----	2½¢ per lb., but not less than 17¼% nor more than 35% ad val-----	}-----31%
	Strand-----	35% ad val-----	

NOTE.—The rate fixed in the Tariff Act of 1930 on wire rope and wire strand was 35 percent ad valorem. The duty on wire rope was changed as indicated above, effective January 1, 1939, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	278,840	12,871	265,269	3,726	268,994	1.4
Value (\$1,000).....	41,799	1,515	40,284	1,291		
Unit value (per pound).....	\$0.150	\$0.112	\$0.152	\$0.078		

¹ Foreign value.

Imports were abnormally low in 1939 because of war conditions in Germany, the United Kingdom, and Japan, which were the principal sources of United States imports. In 1939 imports were 42 percent less in quantity than the average for the years 1935 and 1937. Hence, a statistical comparison of imports with production, consumption, and exports for a more representative pre-war period (average of the census years 1935 and 1937) is shown below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	240,540	13,298	227,262	6,572	233,634	Percent 2.7
Value (\$1,000).....	35,262	1,399	33,863	1,453		
Unit value (per pound).....	\$0.147	\$0.105	\$0.149	\$0.071		

¹ Foreign value.

Wire rope consists of a number of twisted wire strands having a core of hemp, wire strand, or other material. Each strand is made of twisted wires, usually of steel but sometimes of phosphor bronze, monel metal, or other materials. Wire rope is made in many different grades, and is used chiefly in oil drilling, elevators, logging, and aerial tramway operations. Wire strand is sometimes used separately rather than as a component of wire rope. In that event, it is usually galvanized for resistance to corrosion, and is used chiefly for supporting poles and for other guying purposes and for highway guard fences.

The largest producers have their own steel-making facilities, but a large part of the output is manufactured by concerns which purchase their steel, in the form of either wire rods or wire.

The United States is the leading producer, but the United Kingdom and Germany normally have a larger export trade. In recent pre-war years Germany, Japan, and the United Kingdom were the principal sources of United States imports. The German and Japanese rope was inferior to the British and American rope, and was sold at lower prices.

Imports constituted only a small proportion of the United States consumption. It is probable that 50 percent changes in the rates of duty would have practically no effect on domestic consumption and only a minor effect upon domestic production.

Before the war, the Philippine Islands and Mexico were our principal export markets. Canada, Panama, and Cuba, and other Latin American countries were also important outlets.

POST-WAR SHORT TERM

It seems probable that the deferred civilian demand, both here and abroad, will be sufficiently large at high income levels to maintain the production and consumption of wire rope and strand at a high rate for several years after the war, possibly considerably above the level of 1939. It is likely that oil drilling, mining, logging, and construction industries, the principal consumers of wire rope and strand, will be very active during this period.

Imports may be substantially below average pre-war levels because of the devastation of war, especially in Germany and Japan. Imports from the United Kingdom, however, may be resumed on a normal basis shortly after the close of the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption and production of wire rope and strand may increase about 10 percent above the level of 1939, because of the growth of population. It is estimated that consumption may total about 300 million pounds, and that foreign and domestic price levels are likely to be about the same as in 1939.

Duty as in 1939.—Imports may be about 6 million pounds, with a foreign value of \$470,000. If the industries of Germany and Japan are restricted during this period, other foreign countries may become relatively more important sources of supply for the United States market than they were before the war. Production for the domestic market would amount to about 294 million pounds, with a value of about 44.8 million dollars.

Duty reduced by 50 percent.—This reduction might result in considerably larger imports than those with no change in duty in view of the fact that the normal rate of duty is higher than for most steel products. Imports may amount to approximately 12 million pounds having a foreign value of \$940,000, increasing in both quantity and value about 100 percent above those that would be made if the duty were unchanged. Under these conditions, imports would represent about 4 percent of estimated consumption. Production for the domestic market may amount to about 288 million pounds, with a value of 43.8 million dollars.

Duty increased by 50 percent.—It seems probable that this increase in duty would result in a substantial reduction in import trade. Imports might approximate 2 million pounds, having a foreign value of \$160,000. Production for the domestic market might approximate 298 million pounds, valued at 45.3 million dollars.

Per capita income 75 percent higher than in 1939.

At this income level, consumption may amount to about 450 million pounds. This quantity would represent about 50 percent more than with income at the level of 1939. It is assumed that, regardless of duty changes, the unit value of the domestic output would increase from 15 cents (1939) to 17 cents, more or less in line with general price rises, and that imports would be valued at 8.8 cents per pound, compared with 7.8 cents in 1939.

Duty as in 1939.—Imports may be in the neighborhood of 7 million pounds, having a foreign value of \$620,000. The presumption is that adequate foreign supplies would be available even if the German and Japanese industries were restricted. Other foreign countries may gain in relative importance as suppliers of the United States market. Production for the domestic market may amount to about 443 million pounds, with a value of 75.3 million dollars (at 17 cents per pound).

Duty reduced by 50 percent.—This reduction in duty might result in increasing imports to about 14 million pounds valued at \$1,240,000.

Production for the domestic market might amount to about 436 million pounds, valued at 74.1 million dollars.

Duty increased by 50 percent.—Imports are roughly estimated at 4 million pounds having a foreign value of \$350,000. Production for the domestic market would amount to approximately 446 million pounds, valued at 75.8 million dollars.

Exports

The long-term prospects of the United States in export trade in wire rope and strand may depend more on world income levels than on any other factor. With income levels comparing favorably with 1939, it seems likely that United States exports may be as large as or larger than they were in that year (13.5 million pounds, valued at \$1,500,000). The domestic product is sold on a quality rather than a price basis.

Employment

Data respecting employment in the industry are not available. The industry has been highly mechanized for many years and at equivalent production rates, the number of workers may not vary appreciably from pre-war levels.

WOVEN-WIRE CLOTH, FOURDRINIER, AND CYLINDER WIRE

Tariff paragraph: 318.

Commodity: Woven wire cloth, Fourdrinier, and cylinder wire.

Rate of duty: 12½% to 75% ad val. *Equivalent ad valorem (1939):* 58%.

NOTE.—The rate of 50 percent ad valorem imposed by the Tariff Act of 1930 on Fourdrinier and cylinder wires suitable for paper-making machines and on woven-wire cloth, having over 55 meshes per inch suitable for making these wires, was increased to 75 percent by proclamation of the President under section 336, effective April 15, 1931. The statutory rates of 25 or 40 percent ad valorem on other woven-wire cloth not finer than 90 meshes per inch were changed to specific rates and decreased about one-third (on the basis of 1939 imports) pursuant to the trade agreement with Canada, effective January 1, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	32,692	794	31,898	310	32,208	Percent 1

¹ Landed value; foreign value was \$177,000.

The scope of this report covers woven-wire cloth, gauze, fabric, or screen of all metals. Insect screening accounted for 39 percent of the value of production in 1939; Fourdrinier and cylinder wire for paper-making, 16 percent; and other woven-wire or cloth used for filtering, sifting, screening, conveying, straining, and similar purposes accounted for 45 percent.

Imports were low in 1939 compared with the 3-year period 1935–37, during which years imports averaged \$345,000 (foreign value) annually, or with the 5-year average 1935–39 of \$280,000. About 55 per-

cent of the value of imports is Fourdrinier wire used in the manufacture of paper, 30 percent is woven wire or cloth 90 mesh or finer, and 15 percent is woven wire or cloth coarser than 90 mesh. The estimated foreign unit values of these three classifications for 1939 are \$1.14, 91¢, and 11¢ per pound, respectively. Imports are reported in square feet. Production is reported in pounds. Conversion factors, generally used in the trade, were used to obtain the estimated values per pound of imports; i. e., an average of 3 square feet for 1 pound for Fourdrinier and woven wire 90 mesh or finer, and 1½ square feet for 1 pound as a general factor for the imported woven wire coarser than 90 mesh. The average value of Fourdrinier and cylinder wires used for paper making produced in the United States in 1939 was \$1.75 per pound, compared with an estimated \$2.20 per pound (landed value) for the classifications of Fourdrinier imported. There are no readily comparable production data for the two other import categories. Imports of both ferrous and nonferrous insect screening have been unimportant.

In 1939 Germany supplied a little more than one-third of the value of imports, and France and the Netherlands each about one-sixth. Sweden and Canada were the other important sources. However, for the period 1935-37, about half the imports came from Germany; 20 percent came from Austria; and France, the Netherlands, Sweden, and Canada supplied most of the remainder.

POST-WAR SHORT TERM

It is anticipated that the production of paper may be 50 percent greater in the immediate post-war years than in 1939, owing to accumulated civilian demands and depletion of reserve stocks; this will make a strong demand for Fourdrinier wires. Demands for insect wire and for woven wire for a wide range of articles will probably be in considerable quantity, as production of these for civilian consumption was restricted in war years.

It seems likely, therefore, that there may be a much greater consumption and production of woven wire than in 1939. Imports, however, may be somewhat less than in 1939, as it seems reasonable to expect that wire mills (particularly those in Germany, Austria, France, the Netherlands, and Belgium) will require several years to return to peacetime production.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Probable consumption of insect screening may be about at the 1939 level or slightly less, as air-conditioning of buildings may reduce the over-all demands. Substitutes which have been developed during the war for a number of the smaller woven-wire manufactured articles may continue to be used. On the other hand, it is anticipated that the production of paper may be 10 to 20 percent greater than in 1939. In addition, considerably more of the finer mesh wires, which are much higher in price than the insect wire (about four to five times for the nonferrous and two to three times for the ferrous), may be required by

the chemical and food processing industries; both of these industries may use a little greater volume of stainless and noncorrosive wire than before the war. Other industries also may add somewhat to the increased volume of demand. In the aggregate, consumption may be 20 to 30 percent greater in value than in 1939, or, say, about 40 million dollars. Changes in the rates of duty, by 50 percent, would affect consumption somewhat, but hardly enough to warrant separate estimates under the several duty assumptions.

It is assumed that the productive capacity of Germany will be restored.

Duty as in 1939.—With greater demands anticipated for fine mesh (including more alloy steel and nonferrous metal wire) and paper-making wires, imports may be 25 percent greater in value than in 1937 (\$400,000 foreign value), when Germany was more active in this field than in 1939, and may have a foreign value of about \$500,000 (\$900,000 landed value). Imports may be about 2 percent of consumption. Production for the domestic market would then be about 39 million dollars.

Duty reduced by 50 percent.—This condition might stimulate importation of the fine mesh wire, including wires used in paper manufacture (which categories account for 8–10 million dollars of production), but probably would not affect the coarser cloths and screening. Imports may be around 4 percent of consumption, and their foreign value may be about 1 million dollars (1.6 million dollars, landed value). Production for the domestic market may be about 38½ million dollars.

Duty increased by 50 percent.—It seems unlikely that this would greatly reduce the volume of imports of fine mesh and special types below that which would prevail with duty at the 1939 level. Imports, however, might be a little less than 2 percent of consumption and might have a foreign value of about \$400,000 (\$700,000, landed value). Production for the domestic market would then be about 39.3 million dollars.

Per capita income 75 percent higher than in 1939.

At this level of income the production of paper might be 50 percent greater than in 1939, but demands for other wire covered in this section may not increase more than 10 to 20 percent in terms of quantity. The value of both production and imports will show greater increase than the quantities, on account of the additional cost of alloy steels and the anticipated larger use of nonferrous wires and nonferrous screens. The value of consumption would probably be about 50 million dollars. The share of imports in consumption would probably be higher than at the lower level of income, since the imports are mainly of the higher priced articles.

Duty as in 1939.—Imports might be about 3½ percent of consumption and might have a foreign value of about 1 million dollars (1.7 million dollars, landed value); production for the domestic market might be about 48.3 million dollars.

Duty reduced by 50 percent.—Imports may be twice as great as with unchanged rates of duty because of the reasons stated above. They might be 7 percent of consumption and might have a foreign value of 2 million dollars (3.5 million dollars, landed value). Production for the domestic market would then be 46½ million dollars.

Duty increased by 50 percent.—The total value of imports might be 20 to 30 percent below that with 1939 duty rates prevailing. Imports then might be about 3 percent of consumption and might have a foreign value of about \$800,000 (1.4 million dollars landed value). Production for the domestic market then would be around 48½ million dollars.

Exports

Before the war, United States exports of these wire products consisted very largely of screening. The Philippines, Mexico, Venezuela, Cuba, and Canada took about half of the total value. It seems reasonable to expect somewhat greater demands abroad for the higher quality screening and woven wire during the long-term post-war period. With per capita income at the 1939 level, exports may be 40 to 60 percent greater than in 1939, or 1.2 million dollars. With per capita income at the higher level and a larger use of nonferrous and alloy steel wires, exports may be 20 to 30 percent greater, or about 1.5 million dollars.

Employment

According to commercial directories, 100 to 125 concerns produce these commodities. No separate data are available regarding employment, as most of these wire-drawing mills make other classes of wire products in the same plants. Employment may not increase under greater production in the same proportion, owing to improvement in mechanization.

ANTIFRICTION BEARINGS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
321.....	Antifriction bearings:		
	Balls and rollers.....	8¢ per lb. + 25% ad val.	46%
	Ball bearings and parts (except balls).	8¢ per lb. + 35% ad val.	49%
	Roller bearings and parts (except rollers).	8¢ per lb. + 35%.....	54%

NOTE.—The rate fixed in the Tariff Act of 1930 was 10 cents per pound plus 45 percent ad valorem. This was reduced to 8 cents plus 35 percent, effective August 3, 1935, pursuant to the trade agreement with Sweden, and on January 1, 1939, the rate on balls and rollers was further reduced to 8 cents plus 25 percent, pursuant to the United Kingdom trade agreement.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	104,874	3,062	101,812	1,493	103,305	Percent 0.48
Persons employed (number).....	Less than 20,000					

¹ Foreign value.

NOTE.—Because of many types and sizes, quantities are not informative and are not used herein.

While domestic production, exports, and consumption were not unusual in 1939, the usual correlation between imports of bearings and automobile production was reversed. From 1938 to 1939 motor vehicle production rose while imports of bearings fell. Because of this departure from the normal, this discussion is based on the average consumption for the years 1935-39 (\$105,000,000) and the average imports for the same period (\$800,000 foreign value). The average ratio of imports to consumption was three-fourths of 1 percent.

Ball and roller bearings (antifriction bearings) are widely used in machinery and vehicles. They are practically essential in many articles of both consumers' and producers' equipment; for many other articles they are superior. The largest pre-war user was the automobile industry, which took from 50 to 60 percent of the output. Other large uses are in machine tools, agricultural implements, and airplanes. In armaments they are of the greatest importance.

In the United States there are 20 to 30 manufacturers, the largest of which is a subsidiary of an automobile manufacturer. Two large firms are affiliated, respectively, with a Swedish and a British bearing maker.

The Swedish company (commonly called S. K. F.) has a large plant in Sweden and subsidiaries which are the largest producers in Germany and France. The pre-war output of this company is estimated at about one-third of the world supply. The Soviet Union, Great Britain, Italy, and Japan are large producers.

The principal exporting countries before the war were the United States, Great Britain, Sweden, Germany, and Italy. Imports into the United States have consisted mainly of two classes: (a) Shipments from the Swedish and British firms to their affiliates in the United States (these shipments were of certain types of bearings which were not in great demand here and which these companies could supply to better advantage from the home plants); and (b) shipments of competitive products, principally from Germany. If any bearing in the first class should come to be in substantial demand, its production would probably be undertaken in domestic plants. Imports into the United States during recent pre-war years were very small (less than 1 percent) in relation to domestic production. The many types required for stock to meet the users' needs, and the exactitude specified by consumers in the United States are obstacles to a general import trade on a large scale.

It is probable that the cost of producing those types of bearings which are made on a small scale is lower in Sweden than in Great Britain, and possibly lower in both than in the United States.

Inasmuch as the largest users of antifriction bearings are the motor-vehicle producers, production of antifriction bearings will tend to follow the same trend as the production of automobiles; the latter is especially sensitive to changes in national income. Price may in a few cases influence the choice between antifriction and plain bearings, and to that extent affect consumption of the former.

POST-WAR SHORT TERM

After manufacturing plants have been reconverted to regular production, the production of motor vehicles will probably reach an annual output of about 6 million units. At the same time the output

of other machinery requiring ball and roller bearings is likely to be at a high level. In the first few years following the war it may be expected that annual domestic production of bearings will be substantially above the 1939 level. Imports of bearings may not be above the 1939 level, as Germany was then an important source and probably will not be able to produce on a large scale for some time after the war. Moreover, the demand for bearings in foreign producing countries themselves is likely to restrict the quantity exported to the United States.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The production of automobiles was abnormally low in 1939 in relation to national income, so it seems probable that even with the same income production might be about 30 percent greater, or 15-20 percent above the average for 1935-39. Allowing for a parallel increase in consumption of other kinds of machinery, consumption of bearings might increase to a value of 120-140 million dollars annually. What effect changes in the duty may have on import trade is highly uncertain. At lower rates of duty the market for bearings of special types and sizes might be more largely supplied by imports, whereas at higher rates of duty there would be a tendency for more such bearings to be produced in the United States.

Duty as in 1939.—It seems probable that imports would remain at about the same ratio to consumption, approximating a foreign value of 0.9-1.0 million dollars annually. This range is also consistent with the past correlation between automotive production and imports of bearings.

Duty reduced by 50 percent.—A decrease in duty might possibly tend to expand imports by as much as 5 or 6 times, compared with what they would be under the 1939 rate of duty. But there could be no assurance that the imports would expand appreciably, say, by more than 50 percent. Consequently the imports might amount to 1.5-5 million dollars (foreign value).

Duty increased by 50 percent.—As the duty under these conditions would approximate 75 percent, a sharp reduction in imports might occur. American subsidiaries might tend toward domestic production, and imports might fall to \$300,000 or \$500,000, foreign value.

Per capita income 75 percent higher than in 1939.

Automotive production of 6-7 million vehicles might be reached and the consumption of other machinery might be doubled. This would indicate a consumption of bearings about 75-100 percent above the average of 1935-39, amounting to 200-225 million dollars.

Duty as in 1939.—With no change in duty there seems no reason to expect a change in the relation of imports to domestic consumption. Imports might then range from 1½-2 million dollars, foreign value.

Duty reduced by 50 percent.—The considerations discussed under the assumption of the lower income might lead to imports with a range as wide as 2-10 million dollars, foreign value.

Duty increased by 50 percent.—This might result in a proportionate decrease of imports similar to that under the lower income, of \$500,000 to \$750,000, foreign value.

Exports

In 1939 direct exports were about 3 percent of production. Canada was the principal market. Canadian branches of American automobile companies use a large part of these bearings. Canadian production of motor vehicles is about 4 percent of the American output. Other pre-war markets for United States bearings were Japan, the Soviet Union, France, and Great Britain. In addition to direct exports, automobiles and machinery exported in very large volume contain many antifriction bearings.

Employment

Employment in this industry is reported together with that in the production of gears, chains, and other power transmission apparatus. The value of bearings produced is more than half the total value of output of the group. Total wage earners in the group in 1939 amounted to 30,000, and would probably increase or decrease about in ratio with the value of United States output.

CYLINDRICAL TANKS OR VESSELS

Tariff paragraph: 328.

Commodity: Cylindrical tanks or vessels (mainly of steel).

Rate of duty: 25 percent ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 units).....	(1)	(1)	(1)	200	(1)	<i>Percent</i> (1) 1.9
Value (\$1,000).....	49,166	4,073	45,093	870	45,963	
Unit value (each).....	(1)	(1)	(1)	\$2.61		
Persons employed (number).....	6,964					

¹ Not available.

² Landed value (estimated); foreign value was \$521,000.

Imports were abnormally low in 1939, chiefly because of war conditions. In 1939 imports were 50 percent less in quantity and 38 percent less in value (foreign) than the average for the two earlier census years. The average consumption for the three years 1935, 1937, and 1939 was valued at about 41.5 million dollars, which may be a satisfactory basis for estimating post-war consumption; production for the domestic market averaged about 40 million. A summary table of production, exports, imports, and consumption for a more representative pre-war period (average of census years 1935 and 1937) is shown below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 units).....	(1)	(1)	(1)	402	(1)	Percent (1)
Value (\$1,000).....	41,413	3,645	37,768	\$1,420	30,188	3.8
Unit value (each).....	(1)	(1)	(1)	\$2.10	.....	.....

¹ Not available.

² Landed value (estimated); foreign value was \$845,000.

In 1939 there were 64 establishments in the United States engaged primarily in the production of steel barrels, kegs, and drums, with a total output valued at about 49 million dollars. The industry included both subsidiaries of steel producing companies and independent concerns.

Imports¹ in 1939 and in previous years accounted for only a small part of consumption and were greatly exceeded by exports. The bulk of the containers imported came from Greece, Germany, Spain, Italy, the United Kingdom, France, and Japan; they were nearly all filled rather than empty, commonly with a wide variety of commodities, of which quicksilver, olive and other oils, and chemicals, were perhaps the most important items.

Whether full or empty, these containers are dutiable upon original importation² at 25 percent ad valorem, except filled "one time" containers (not capable of re-use), which are not dutiable separately from their contents.

The value of containers is generally small as compared to the value of their contents, and imports are largely determined by the import trade in their contents. Changes of 50 percent in rates of duty on containers are not likely to have much effect on imports. Changes in duties on commodities imported in these containers may, however, affect imports of the containers. No exact estimate can be made of this effect, but in the aggregate it is likely to be only moderate and resultant changes in imports of containers are not likely to affect domestic production appreciably.

POST-WAR SHORT TERM

It seems likely that the deferred civilian demand both here and abroad, under presumably high income levels, will result in a high rate of consumption and production, probably considerably above the level of 1939. Because of the devastation of war in Europe and Asia, it is probable that imports (mainly of filled containers) will be considerably below even the low level of 1939.

¹ Only imports dutiable under paragraph 326 are considered throughout this report. Excluded are: (1) Heavy types of vessels (metal walls $1\frac{1}{4}$ inches or more in thickness, etc.), dutiable under paragraph 319 (b); (2) containers made in or exported from the United States and subsequently imported; under certain conditions, these containers enter free of duty, under paragraph 1615. These containers may be reexported, and the process may be repeated indefinitely. Frequently the more expensive types of containers (such as quicksilver flasks) constitute a revolving supply in international trade and, because of an economic advantage to both the importer and the exporter, normally receive special tariff treatment in the United States and are allowed to enter free.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The past trend, if continued after the war, is likely to result in a per capita consumption and production of containers somewhat larger than the 1935-39 average; production for the domestic market might reach 50 million dollars. Imports will probably bear about the same relation to consumption as in 1935 and 1937, and might amount to about \$1,750,000 under all three duty assumptions.

Per capita income 75 percent higher than in 1939.

A large increase in national income over the 1939 level, by affecting general business activity favorably, would encourage the consumption and production of containers. They might be 50-60 percent higher than with income at the 1939 level; production for the domestic market might be 75-80 million dollars. Imports would probably be 3-4 percent of consumption, and might be valued at 2.3-3.2 million dollars.

Exports

The long-term prospects for export trade will presumably depend more on world income levels than on any other factor. With income levels about the same as in 1939, United States exports might equal or exceed those of that year (about 4.1 million dollars), assuming that world tariff and other trade restrictions would be about the same as in 1939; with world income much higher, exports would probably be much higher. Our trade would benefit from decreases in foreign trade restrictions, and would be adversely affected by increases in them.

Employment

There were 6,964 persons employed in the domestic industry in 1939. After the war the number of workers will probably vary about in proportion to the quantity produced.

UPHOLSTERERS' NAILS AND THUMBTRACKS

Tariff paragraph: 331.

Commodity: Upholsterers' nails and thumbtracks of two or more pieces of iron or steel.

Rate of duty: 4½¢ per pound.

Equivalent ad valorem (1939): 17%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 3 cents per pound, which was increased to 4½ cents, effective January 13, 1933, by Presidential proclamation under section 336 of the Tariff Act.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Exports	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds).....	2 3, 230	(?)	820	4, 050	Percent 20
Value (\$1,000).....	1, 268	(?)	213		
Unit value (per pound).....	\$0.363		\$0.260		

¹ Probably includes some types not included in imports, but the amounts are believed to be relatively small.

² Partly estimated.

³ Not separately reported in official statistics but believed to be small.

⁴ Foreign value.

Production in 1939 was about equally divided between upholsterers' nails and thumbtacks, but in periods of higher levels of income the production of upholsterers' nails, which usually follows the trend of furniture output, is likely to increase faster than that of thumbtacks. Production of these nails and tacks amounted to about half a million dollars in 1929, declined about one-half to 1931, and thereafter increased steadily to 1939. The production of these nails and tacks accounts for only a relatively small part of the total output of the firms that make them, as they are engaged primarily in the manufacture of a large variety of other types of articles.

Before the war Germany was the principal foreign supplier, accounting for 75 to 90 percent of the United States imports. The German thumbtack industry, like other iron and steel industries, was subject to cartels.

Imports increased sharply from 1929 to 1932, in contrast to the decline in domestic production in the same period. In 1933 the rate of duty was increased from 3 cents to 4½ cents per pound, and thereafter the ratio of imports to consumption declined steadily.

Exports from the United States are not reported separately, but are believed to be small.

POST-WAR SHORT TERM

Consumption will probably be considerably greater than in 1939, due principally to a large backlog of consumer demand for furniture and to the expected continued high level of per capita income. Imports might supply about one-fifth of the demand, as in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption might be greater than in 1939 by about the percentage of increase in population. Germany will probably again be competitive. Changes in duty would probably not influence consumption materially, but would most likely affect imports. Consumption might amount to about 4.3 million pounds.

Duty as in 1939.—Imports would probably supply the same share of the domestic market as in 1939, or about one-fifth, which would amount to approximately 850,000 pounds, with a foreign value of about \$220,000. Domestic production in that case would be about 3.5 million pounds, valued at \$1,375,000.

Duty reduced by 50 percent.—Imports might supply about two-fifths of consumption, or approximately 1.7 million pounds, with a foreign value of about \$450,000, and United States production about 2.6 million pounds, valued at 1 million dollars.

Duty increased by 50 percent.—Imports would supply a smaller part of the United States market, probably 5 to 10 percent. They might amount to approximately 325,000 pounds, valued at about \$85,000. Domestic manufacture would then account for about 4 million pounds, valued at \$1,570,000.

Per capita income 75 percent higher than in 1939.

Consumption might be about 15 percent greater than with no change in income and probably amount to about 5 million pounds, owing principally to an increase of 25 to 50 percent in the demand for upholsterers' nails.

Duty as in 1939.—Imports might supply about 1 million pounds, or one-fifth of consumption, with a foreign value of approximately \$300,000, if prices increase 10 to 15 percent. Domestic production would then amount to at least 4 million pounds, valued at about \$1,775,000.

Duty reduced by 50 percent.—Imports might increase to about 2 million pounds, or two-fifths of consumption, valued at about \$600,000 at the higher price level. The domestic industry would supply about 3 million pounds, valued at about \$1,330,000.

Duty increased by 50 percent.—Imports probably would supply no more than about 375,000 pounds, or 5 to 10 percent of consumption, valued at about \$110,000. Production would then supply about 4,625,000 pounds, valued at about 2 million dollars.

WIRE NAILS

Tariff paragraph: 331.

Commodity: Wire nails, spikes, tacks, brads, and staples.

Rate of duty: $\frac{1}{2}$ ¢ and $\frac{3}{4}$ ¢ per lb.

Equivalent ad valorem (1939): 19%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export ¹	For domestic market			
Quantity, (1,000 lb.)	1,445,149	57,784	1,387,365	15,355	1,402,720	Percent 1.1
Value (\$1,000)	45,004	1,697	43,307	319		
Unit: value (per pound)	\$0.0312	\$0.0294	\$0.0313	\$0.0208		

¹ Wire nails.

² Partly estimated.

³ Foreign value.

The United States is the world's leading producer and consumer of wire nails and related products. Production usually exceeds one billion pounds, and consists principally of wire nails. Demand follows

the general trend of business activity, particularly in the building industry, and is little affected by price changes.

Imports generally supply only a small part of the United States consumption. Germany and Belgium have been the principal foreign suppliers; Canada normally ranked third. Sales of the imported product have been restricted almost entirely to areas contiguous to ports of entry. The products are low-priced and the added cost of transporting them a considerable distance eliminates any competitive advantage of the imports. It is doubtful, therefore, whether a change in duty would alter the position of imports in the domestic market to any great extent, except possibly in areas adjacent to ports of entry. Should German production be curtailed after the war, the following import estimates would tend to be too high.

United States exports are usually somewhat greater than imports, but represent only a small part of domestic output. They are shipped principally to markets in Latin America and Asia.

POST-WAR SHORT TERM

During the first few years after the war, consumption and production will most likely be much greater than in 1939, as there will exist a backlog of demand imposed not only by the war but by the under-building in the 1930's. This increase is not likely to alter the relative importance of imports in the domestic market.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

It is probable that the increase in the consumption of nails will be at least commensurate with the increase in population. Consumption may total 1,550 million pounds. It is also probable that imports, as formerly, will supply only a relatively small part of the market. Under the 1939 rate of duty, imports might total 15-25 million pounds, valued at roughly \$300,000-\$500,000 if foreign unit values remain the same as in 1939 (2.08 cents per pound). If the rate of duty were decreased 50 percent, imports might increase to 25-40 million pounds, valued at \$500,000-\$850,000. With a 50 percent increase, they might drop below 15 million pounds, valued at, say, \$300,000.

United States production (including that for export) would probably amount to about 1.6 billion pounds under the 1939 rate of duty. It would vary only slightly with the changes in duty because imports represent only a negligible part of consumption. The value of production for the domestic market would be about 50 million dollars.

Per capita income 75 percent higher than in 1939.

It has been estimated that building activity may be over 175 percent greater than in 1939. It seems unlikely, however, that the production and consumption of nails will increase at the same rate because of natural limitations on the supply of certain nail-using building materials (particularly lumber) for which the substitution of metal and other materials may occur. Moreover, improved construction techniques may reduce the need for the common nail. On the other hand, there are certain purposes for which nails are used which are not governed directly by the use of lumber, e. g., the laying of shingles,

tiles, and other roofing material, and general farm purposes. Taking these factors into consideration, production and consumption might be 50-75 percent greater than in 1939. Consumption might total about 2.3 billion pounds, of which 25-35 million might be supplied by imports if the 1939 rate of duty were effective. If prices increase 10-15 percent over 1939, the foreign value of these imports might amount to \$600,000-\$800,000. With a 50 percent reduction in the duty, imports might increase to 35-60 million pounds, valued at \$800,000-\$1,400,000 (foreign value). With a 50-percent increase, they might drop to 20-30 million pounds, valued at \$500,000-\$700,000 (foreign value).

United States production for the domestic market would probably be about 2.27 billion pounds under the 1939 rate of duty, valued at about 82 million dollars. There would be some variation in production if the rates of duty were changed, but it would be relatively small because of the preponderance of domestic nails in the United States market.

Exports

Before the war the lower price of the German product gave that country an advantage in world markets. If Germany resumes its former position in foreign trade, the ratio of United States exports to domestic production will probably remain about the same as in 1939, or about 5 percent. Domestic exports would then probably be about 70 million pounds, valued at over 2 million dollars if prices remain at the 1939 level, or at over 2.3 million dollars if prices rise 10 to 15 percent under the higher level of income. If Germany's ability to supply this trade is reduced materially, the United States may be in a better competitive position and may increase its exports substantially, particularly in areas outside Europe where European producers would not have the advantage of lower transportation costs. The reasonableness of such an assumption is supported by the fact that during the First World War and before the European steel industry recovered from its effects, American manufacturers were able to profitably export substantially greater amounts of nails than in recent years. Any expansion in export markets naturally would be reflected in domestic output.

Employment

There are no official statistics on the number of workers in this industry.

SILVER-PLATED WARE

Tariff paragraph: 339.

Commodity: Silver-plated table, household, kitchen, and hospital utensils, and hollow or flat ware (except cutlery).

Rate of duty: If plated on nickel silver or copper, 35 percent; if plated on other metals, 50 percent.

NOTE.—The rate of duty fixed in the Tariff Act of 1930 on silver-plated ware was 50 percent. The 35 percent rate shown above has been effective since January 1, 1939, pursuant to the United Kingdom trade agreement. The bulk of the imports in 1939 entered at that rate.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	17,326	167	7,159	1,663	7,822	8
Persons employed.....	(²)					

¹ Silver-plated hollowware, novelties, trophies, toilet ware, and other articles; total production of silver-plated ware including flat ware (knives, forks, and spoons) was valued at \$32,745,454.

² Landed value; foreign value was \$454,000.

³ Not available; employment in the branch of the silverware industry that makes silver-plated ware is estimated at 9,000.

Modern silver-plated hollow ware considered in this report includes tea sets, bowls, trays, and similar articles. Silver-plated knives and forks are the subject of a separate section (cutlery, par. 355); also silver-plated articles made prior to 1830 (antique silverware, par. 1811). Imported hollow ware competes principally with high-quality domestic ware. A substantial proportion of the domestic output consists of low- and moderate-priced ware manufactured largely by mechanical means.

Large manufacturers of silver-plated ware generally make a complete line in several different grades, including finest quality plate, unbranded silverware, premium ware, and low-priced ware for distribution by chain stores. Hotels, restaurants, clubs, railroads, and steamship lines usually purchase good quality ware. Most silver-plated hollow ware articles are simple in design and construction and the large modern plants producing them are highly mechanized. Silver accounts for a relatively small part of the cost of production. Articles to be plated are commonly made of nickel silver (a copper-nickel-zinc alloy), white or Britannia metal (a tin-antimony alloy), and copper or brass. Nickel silver, and Britannia metal are the most satisfactory bases; copper and brass, which are cheaper but less durable, are used for many hollow ware articles, particularly reproduction of antiques.

The United Kingdom has been the principal source of imports. Much of the imported British ware is electroplated on nickel silver or copper, and consists of reproductions of old designs.

During the war little silver-plated hollow ware has been made. What has been made has consisted primarily of flatware for the armed forces. Curtailment of production for civilian use became necessary in order to conserve critical materials such as nickel, silver, and copper. The largest establishments manufacturing silver-plated ware have been converted almost entirely to the production of war products such as shell cases and aircraft parts.

POST-WAR SHORT TERM

There will probably be a strong domestic demand for silver-plated hollow ware after the war to replenish stocks of retail stores and to meet the accumulated needs of restaurants, hotels, and institutions. Domestic consumption may be at least twice as great as in 1939 for 1 or 2 years after the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of silver-plated hollow ware and miscellaneous articles will probably increase more than proportionately with the increase in population, since the trend in per capita consumption has been upward. New public services, such as travel by airplane, are opening up new markets for the industry. Because imports consist largely of high-quality ware with prestige value, a 50-percent change in the duties in either direction would probably affect the imports only moderately, and the effect on total consumption and on domestic production would be too small to justify separate estimates for the different duty levels. Consumption might be around 10 million dollars and domestic production (including exports of \$200,000) might be valued at around 9.5 million dollars.

Duty as in 1939.—Imports would probably continue to consist chiefly of silver-plated ware from the United Kingdom, and would probably supply the same proportion of consumption as in 1939. They might have a landed value of about \$800,000 (\$550,000 foreign value).

Duty reduced by 50 percent.—Imports from other countries as well as from the United Kingdom would doubtless increase appreciably, and the total might rise to about 10 percent of domestic consumption. They might have a landed value of close to 1 million dollars (\$775,000 foreign value).

Duty increased by 50 percent.—Imports would probably be limited largely to high quality utensils from the United Kingdom, and perhaps would have a landed value of \$650,000 (\$400,000 foreign value) annually. They would constitute about 6 percent of domestic consumption.

Per capita income 75 percent higher than in 1939.

With greatly increased purchasing power, the demand for plated silverware probably would expand accordingly. Production (including exports of \$300,000) might rise to about 17 million dollars. Consumption might be 80 percent higher than with no increase in income, and reach 18.0–18.5 million dollars. In one pre-war year (1927) consumption amounted to 17 million dollars (i. e. 120 percent above 1939). Because of this level of income, imports, which consist chiefly of the better grades, might have a somewhat higher ratio to consumption than under the lower income level.

Duty as in 1939.—The United Kingdom would doubtless continue to be the predominant supplier of imports, but other countries would perhaps participate in the trade to a somewhat greater extent than formerly. Imports might have a landed value of 1.5 million dollars (about 1 million foreign value), or be about 8 percent of domestic consumption, account being taken of an increase in unit values which might be expected to accompany a moderate increase in the general price level.

Duty reduced by 50 percent.—Competition between domestic and foreign goods would probably increase appreciably. Imports might have a landed value of about 1.8 million dollars (1.4 million foreign value). The competitive position of the higher priced British ware would be especially benefited.

Duty increased by 50 percent.—Although imports would decline, a considerable demand for British ware of high quality would continue. Imports might still be as high as \$1,200,000 (\$750,000 foreign value).

Exports

United States exports of silver-plated hollow ware and miscellaneous articles generally amount to 2 percent or less of domestic production. They consist chiefly of utensils exported to countries without silver-plating industries and of specialties exported to other countries as well. In the long-term post-war period with incomes at the 1939 level exports might amount to \$200,000; with a higher world income they might increase to \$300,000.

Employment

In the long-term post-war period employment in the silver-plated ware branch of the industry might rise to 10,000 persons on the basis of the estimated production at the 1939 income level. With national income 75 percent higher, the number of people employed might be 15,000-20,000.

UTENSILS, BASE METAL

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
339-----	Table, household, kitchen, and hospital utensils, and hollow ware or flat ware:		
	Aluminum-----	8½¢ per lb. + 40% ad val.	} 39%
	Enameled iron or steel.....	5¢ per lb. + 15% ad val....	
	Copper-----	35% ad val.-----	
	Brass-----	40% ad val.-----	
	Pewter-----	25% ad val.-----	
	Other wares-----	40% ad val.-----	

NOTE.—The rates fixed in the Tariff Act of 1930 were: Aluminum ware, 8½¢ per pound plus 40 percent ad valorem; enameled ware, 5¢ per pound plus 30 percent ad valorem; copper, brass, pewter, tin or tin plate, and other wares composed of base metal and not plated with platinum, gold, or silver, 40 percent ad valorem. The rate on enameled ware was reduced to 5¢ per pound plus 15 percent, effective August 3, 1933, pursuant to trade agreement with Sweden; and the rate on copper and pewter ware was reduced to 35 and 25 percent, respectively, effective January 1, 1939, pursuant to trade agreement with the United Kingdom. Since 1939 the rate on tin and tin plate ware was reduced to 22½ percent, effective January 30, 1943, pursuant to agreement with Mexico; the rate on copper ware was further reduced to 30 percent and the rate on brass ware was reduced to 30 percent, effective June 23, 1944, pursuant to agreement with Iran.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000)-----	\$ 110,000	\$ 1,000	\$ 109,000	\$ 850	\$ 109,850	Percent 0.8
Persons employed (number)-----	20,000					

1 Complete data not available; estimate is based on published statistics for most important items.
 2 Exports of enameled and aluminum kitchen and household utensils were valued at approximately \$711,000; export data for other types are not segregated.
 3 Partly estimated.
 4 Landed value; foreign value was \$568,000.

Base-metal utensils consist of a wide variety of cooking, household, and hospital wares made of aluminum, iron or steel (plain, enameled, galvanized, or japanned), tinware, stainless steel, nickel silver (unplated), pewter, and other nonferrous metals, including copper, brass, and bronze. Domestic manufacturers are in a strong position with respect to most of these items, the production of which is highly mechanized. Imports are largely limited to ornamental wares and occasional specialties.

Aluminum and enameled utensils have constituted approximately 50 percent of the total value of production over a long period of years.

Imports consist of a great variety of specialties from many countries and include decorative household articles. Copper and brass utensils, the largest single class, have come mostly from China, the United Kingdom, and British India. Imports of enameled ware have come principally from Sweden and Czechoslovakia; aluminum ware from Italy and Germany; antimony ware from Japan; specialties, such as meat and food choppers, from Czechoslovakia, Sweden, and Germany; fly swatters (in chief value of metal) from Japan; and ornamental wares, such as vases, candlesticks, trays, and bowls, from many countries.

Demand varies both with family income and changes in national income. In normal times, high-income families purchase the better grades of ware and seldom make additional purchases; low-income families, representing most of the American consumer market, purchase lower priced, shorter lived utensils, which need replacement more frequently. When the per capita national income is low, both types of users are likely to postpone renewals; when the income is high, the normal market is extended through replacements, increased sales of higher priced goods, introduction of new types, and improvements in designs and styles. The utilitarian lines, such as cooking utensils, which constitute the bulk of the domestic output, are less influenced by changes in national income than ornamental wares, which constitute the bulk of imports.

Domestic production of base-metal utensils, which was valued at about 100 million dollars in 1929, declined to 50 million dollars in the depression years, and rose thereafter until curtailed by war requirements of the metals used in their production. With the entry of the United States into the war, the kitchen- and household-utensil industry began to produce large quantities of utensils for military use and to make implements required in warfare. Many utensils for military use are of designs and sizes quite different from those for civilian use; production for civilian use has been sharply curtailed and imports have declined greatly.

POST-WAR SHORT TERM

All types of utensils can be produced without much delay when metals again become available. Replenishment of dealers' stocks and meeting the accumulated demand may cause annual production for 1 or 2 years after the war to be as much as twice the 1939 value, or about 200 million dollars.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Taking into account a 10 percent increase in population, consumption might rise to a value of about 120 million dollars annually. Production for the domestic market under any of the assumptions regarding duties would be but little less than the total consumption.

Duty as in 1939.—Imports would probably constitute about the same proportion of consumption as in 1939, and might amount to perhaps \$625,000 foreign value (\$935,000 landed value).

Duty reduced by 50 percent.—Imports of specialties and ornamental wares might increase considerably and might be valued at about \$850,000 foreign value (\$1,100,000 landed value). It is doubtful, however, whether imports of the standard, mass-production articles could compete effectively with similar articles of domestic manufacture.

Duty increased by 50 percent.—Imports would probably be confined largely to the higher-priced wares, with a total value perhaps not in excess of \$500,000 foreign value (\$850,000 landed value).

Per capita income 75 percent higher than in 1939.

Per capita quantitative consumption would probably increase somewhat as compared with that under an unchanged income, and would comprise a larger proportion of higher-priced quality goods, such as stainless steel. Prices would probably also be materially higher. Consumption would perhaps be valued at about 200 million dollars annually. Imports would doubtless share in the improved market, but would hardly supply more than 1 percent of the total value of consumption, even if the duty should be reduced by 50 percent.

Duty as in 1939.—Imports might rise to about 1 million dollars foreign value (1.5 million, landed value).

Duty reduced by 50 percent.—Imports would perhaps reach about 1.5 million dollars foreign value (\$1,950,000 landed value).

Duty increased by 50 percent.—Imports would probably be confined largely to higher priced ornamental wares and specialties, but higher purchasing power in the United States would perhaps sustain imports at about \$800,000 foreign value (\$1,350,000 landed value).

Exports

Although exports of these commodities before the war were substantial, they constituted only about 1 percent of domestic production. A similar situation is probable in the post-war period. Most countries manufacture utensils of these types, but many of them also import, but not ordinarily from the United States.

Employment

Because production of these wares is highly mechanized, employment will not rise proportionately with the higher domestic output. Maximum predictable production might call for the employment of 25,000-30,000 persons, compared with about 20,000 in 1939.

SAWS

Tariff paragraph: 340.

Commodity: Saws.

Rates of duty: Jewelers' saws, 40 cents *Equivalent ad valorem (1939):* 31%
per gross; other saws,
12%, 15%, or 20%
ad val.

NOTE.—The rates fixed in the Tariff Act of 1930 were 40 cents per gross for jewelers' saws and 20 percent ad valorem for all other saws. The rate for hacksaw blades, crosscut, hand, back, and other (hand-working) saws not specifically provided for if valued over 5 cents each, was reduced to 15 percent ad valorem, and the rate for steel hand, pit, drag, and mill saws was reduced to 12 percent ad valorem, both effective August 5, 1935, pursuant to a trade agreement with Sweden.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	16,753	1,754	14,999	1,210	15,209	Percent 1.5
Persons employed (number).....	4,900					

1 Landed value; foreign value was \$145,000.

This report embraces the entire wide range of saws made in the United States. They range from inexpensive items such as hacksaw blades, with an average wholesale value of about 4 cents each, to band and gang saws for sawmill operations and large circular saws for metal cutting, the values of some of which run into hundreds of dollars each. Woodworking saws represented 50 percent of the value of production in 1939, half for power-operated blades and half for hand saws. Metalworking saws accounted for about 40 percent of the total output, and parts and accessories for saws (teeth, handles, frames, etc.) for 10 percent.

In 1939 low-priced hand woodworking saws, and jewelers' piercing saws accounted for 85 percent of total imports. The jewelers' saws are very small, and a considerable part of their cost is in labor. Most of the hand woodworking saws were for making up sets of children's tools, or for sale separately in low-price stores for occasional home use. They did not compare in quality or performance with the lower priced saws made in the United States for similar outlets. Less than 1,500 machine saws and about 2.5 million medium-quality hacksaw blades accounted for the remaining value of imports. During 1935-39 imports averaged \$138,000 (foreign value). Germany supplied about 55 percent of the total, Sweden 37 percent, and the remainder came from a number of other countries.

The estimates in this report are based on probable conditions in the lumber, wood pulp, paper, metalworking equipment, and construction industries. Since there is a substantial difference in the estimates of post-war conditions for these different industries, they have been combined and a composite estimate is used as a basis for the following statements. Assuming national income as in 1939 it seems likely that the requirements for saws for the production of pulpwood used

in making paper and paperboard may increase substantially more than those for saws used in the production of lumber. The construction industry is a large consumer of saws. The anticipated large immediate post-war activities in this field may partly level off by the long term. Activity in the metalworking industries may not exceed the 1939 level as much as that in paper manufacturing.

POST-WAR SHORT TERM

It seems probable that demands for woodworking saws in forestry, sawmills, and construction may continue at wartime levels, while new metalworking saws may be required only in about the same volume as in 1939, because of the probable reduction in the volume of production in the metalworking industries and the transfer of these longer lived saws from wartime to civilian production. It seems reasonable also to expect that consumption of hand saws for home and commercial uses may be considerably greater than in 1939, reflecting the deferred demand of war years. Domestic production of saws may be considerably greater (say by 50 percent in value) than it was in 1939. Germany will probably not be in a position to export, and consequently total imports may be much less than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Taking into consideration anticipated greater requirements for saws in the pulpwood and construction industries and increase in population, consumption may be 20 to 30 percent greater than in 1939, and may have a value, at 1939 price levels, of about 19 million dollars. Consumption would be only slightly affected by changes of 50 percent in the duties.

Duties as in 1939.—Imports may supply a somewhat higher share of consumption than in 1939 because in 1939 the imports of cheap saws were somewhat below average. Imports may amount to nearly 2 percent of consumption or \$360,000 landed value (\$250,000 foreign value). Production for the domestic market then would be about 18.6 million dollars.

Duties reduced by 50 percent.—Under this condition, considerably more of the low-priced jeweler's piercing saws might be imported, as there would be a reduction in equivalent ad valorem from 75 to 80 percent to 35 to 40 percent. Importation of machine saws and the medium-quality woodworking saws might increase 100 to 200 percent in value if these lower duty rates prevailed. Imports might be about 3 percent of consumption, or, say, \$600,000 landed value (\$400,000 foreign value). Production for the domestic market then would be 18.4 million dollars.

Duties increased by 50 percent.—This might reduce the value of importation of cheap saws by 20 to 30 percent, and that of higher-priced hand and machine saws by 40 to 60 percent, as compared with imports at the 1939 rates of duty. Total imports might be little more than 1 percent of consumption, or, say, about \$220,000 landed value (\$150,000 foreign value). Production for the domestic market then would amount to 18.7 million dollars.

Per capita income 75 percent higher than in 1939.

This level of income would bring about increased activity in both woodworking and metalworking industries, and hence greater demand for hand and machine saws. Also with this higher income, a greater number of finer quality and higher priced saws may be purchased for use in homes as well as in industrial and commercial establishments. Furthermore, prices of saws of any given grade and type might be 10-15 percent higher than at the lower income level. The total value of consumption might be 40 percent greater than if 1939 per capita income prevailed, or, say, about 27 million dollars.

Duties as in 1939.—Imports might be a larger proportion of consumption than at the lower per capita income level; they might be about 2½ percent of the total, or, say, \$600 000 landed value (\$400,000 foreign value). Production for the domestic market might amount to 26.4 million dollars.

Duties reduced by 50 percent.—Imports might amount to nearly 4 percent of consumption or about \$900,000 landed value (\$600,000 foreign value). Production for the domestic market then would be 26.1 million dollars.

Duties increased by 50 percent.—Imports would probably be about 1 percent of consumption, or, say, \$300,000 landed value (\$200,000 foreign value). Production for the domestic market then might be 26.7 million dollars.

Exports

Saws are exported from the United States to nearly every country in the world. Canada, the United Kingdom, France, Argentina, and Mexico were the largest foreign markets in 1939. Hacksaws accounted for 57 percent of the total value exported in 1939 (1.75 million dollars); woodworking hand saws, 30 percent; and machine saws, 13 percent. It is anticipated that some of the lumbering activities opened in war years in South America will be continued in the post-war period, and that new metalworking industries started there after 1939 will not be abandoned. It is also possible that other areas—for example, Russia—may increase lumbering activities. Probably the value of post-war exports at 1939 income levels may be 30 to 50 percent larger than before the war, or, say, about 2.5 million dollars. With increased world income, the value may rise by another third, or, say, to 3.3 million dollars, particularly as a greater quantity of high-quality saws would presumably be used in foreign countries at higher income levels.

Employment

It is estimated that in 1939 nearly 5,000 persons were employed in manufacturing saws in the 80 to 90 establishments in the United States where edge tools comprised the principal products. There was a fairly high ratio of skilled and semiskilled labor. Employment might be 5,800-6,000 in the post-war period if per capita income is at the 1939 level, and 6,200-6,500 if the per capita income prevailed.

PINS

Tariff paragraph: 350.

Commodity: Common pins, metal hairpins, safetypins, and miscellaneous pins.

Rates of duty: 30% or 35% ad valorem.

NOTE.—The rate fixed in the Tariff Act of 1930 on all pins covered by this report was 35 percent ad valorem. The rate was reduced to 30 percent on hairpins and dressmakers' or common pins, effective January 1, 1939, pursuant to trade agreement with the United Kingdom. From April 16, 1938 to April 21, 1939, a rate of 30 percent was in effect on safetypins, pursuant to the trade agreement with Czechoslovakia, which has been suspended.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production	Imports	Apparent consumption	Ratio of imports to consumption
Value (\$1,000) ¹	6,296	185	6,481	Percent 2.9
Persons employed (number).....	About 3,000			

¹ Quantity not available. Very little of the production is exported.

² Landed value; foreign value was \$130,000.

The United States is one of the world's leading producers of pins. Domestic demand is supplied largely by United States output. Consumption of all types combined follows roughly the trend of per capita income. Some types are influenced more by styles and other factors than by income, but population changes generally have only a moderate effect on the demand for pins.

Imports supplied a declining share of the United States market for a number of years before the war. This downward trend will probably continue after the war. In 1939 about one-third of the imports consisted of safetypins; one-fourth, hairpins; and the balance, common and miscellaneous pins. The United Kingdom supplied 45 percent, Germany 28 percent, Czechoslovakia 19 percent (principally safetypins), and Japan 5 percent (principally miscellaneous types). Germany and the United Kingdom were important suppliers of all types.

POST-WAR SHORT TERM

It is probable that production and consumption of all types of pins will be considerably greater than in 1939. Imports may also increase but will probably supply a smaller part of the domestic market because the relative importance of imports was declining steadily for a number of years before the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

Domestic pins will probably continue to supply practically the entire demand in the United States, as before the war. Changes in rates of duty would probably have but little effect on consumption.

Per capita income at 1939 level.

Consumption will probably be only somewhat higher than in 1939, say about 6% million dollars.

Duty as in 1939.—Imports would probably supply the same proportion of consumption as in 1939. They would probably amount to about \$135,000 and domestic production to \$6,615,000.

Duty reduced by 50 percent.—Imports might increase to about \$170,000 (foreign value); domestic production might then be about \$6,580,000.

Duty increased by 50 percent.—Imports would probably amount to less than \$100,000 (foreign value) and United States production to about \$6,650,000.

Per capita income 75 percent higher than in 1939.

There might be a commensurate quantitative increase in the consumption of pens. Consumption might amount to 12.5 million dollars, if prices increase 10 to 15 percent.

Duty as in 1939.—Imports would probably amount to approximately \$250,000 (foreign value) and production to \$12,250,000.

Duty reduced by 50 percent.—Imports might amount to about \$325,000 (foreign value) and production to \$12,175,000.

Duty increased by 50 percent.—Imports would probably supply less than 2 percent of consumption, amounting to less than \$200,000 (foreign value), whereas domestic production would probably amount to more than 12.3 million dollars.

Exports

The United States has always been relatively unimportant as an exporter, and it is not likely that its position in foreign markets will change materially, especially if Germany resumes its pre-war position in the industry.

Employment

On the basis of the above estimates, employment will probably range from 3,000 to 5,000 workers, depending upon the levels of duty and national income.

PENS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
351-----	Pens, metallic (except gold):		
	Carbon steel.....	12¢ per gross.....	34.9%
	Other metal.....	14¢ per gross.....	36.2%
	Nib with barrel.....	15¢ per gross.....	14.0%

NOTE.—The rates fixed in the Tariff Act of 1930 were 15 cents per gross on carbon steel pens, 18 cents per gross on pens of other metal, and 20 cents per gross on pens with nib and barrel in one piece. These rates were reduced, effective January 1, 1939, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 gross).....	1,203	189	1,004	281	1,345	Percent 21
Value (\$1,000).....	979	125	854	105		
Unit value (per gross).....	\$0.81	\$0.90	\$0.80	\$0.37		
Persons employed (number).....	370					

1 Foreign value.

Pen points are commonly made of high-carbon strip steel. Some are made of brass, nickel silver, or stainless steel; others are plated with tin, brass, silver, or gold.

Approximately 75 percent of domestic consumption is sold to large users such as schools, banks, large industrial concerns, and government agencies; the remainder to private consumers, with whom "brand preference" is an important consideration. Per capita consumption of pens declined from 2.6 units in 1930 to 1.5 in 1940. This decline is attributed largely to (1) increased use of fountain pens, (2) substitution of mechanical equipment for handwriting, and (3) the increased usage of more durable pens.

The United States industry consists of five manufacturers who employ about 370 workers.

Exports in most years have been less than imports. Imports, which have accounted for 20 to 25 percent of total consumption in recent years, supply a somewhat larger proportion of plated pens and pens of nonferrous metals than of steel. Approximately 80 percent of imported pens are the products of two British concerns, whose brands have an established market in the United States.

Sales of pens of domestic manufacture have increased markedly during the war as a result of strong demand caused partly by high industrial activity and partly by cessation of imports and enlarged exports resulting from British restrictions on exportation of pens.

Relatively few firms here and abroad compete for the existing trade in pens which, perforce, is limited. The trade situation is unlikely to change greatly with time or increased national income. Duty changes would probably have little or no effect on the volume of consumption but might alter the ratio of imports to domestic production and would affect the total consumer expenditures for pens.

POST-WAR SHORT TERM

Under the assumption that national income per capita on the basis of 1939 prices will be about 40 percent greater than in 1939, consumption will probably be somewhat less than during the war years but materially greater than in 1939, perhaps 25-35 percent greater; prices will probably be 20-25 percent higher than in 1939. Imports of British pens will be resumed and may furnish about the same proportion of consumption as in 1939, assuming the duty unchanged. Exports will probably decrease materially, perhaps to about the 1939 figure.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Per capita consumption might be somewhat smaller than in 1939 because of the same factors which were reducing the use of pens in the pre-war decade; these factors, however, have probably already largely spent their force. The decline might be sufficient to offset the increase in population, in which case the consumption would probably be 1.3–1.4 million gross, with a value at 1939 prices of perhaps \$850,000–\$1,025,000, the range being wider than that for quantity because the value depends also on the share of consumption supplied by imports, the value (especially the foreign value) of which, per gross, is much lower than that of domestic pens.¹ Exports would probably be about the same as in 1939, or 140,000 gross valued at about \$126,000.

Duty as in 1939.—Imports would probably be about the same as in 1939, or 270,000–290,000 gross, with a foreign value at 1939 prices of \$100,000–\$110,000. Assuming exports about the same as in 1939 (140,000 gross), production would be about 1,150,000–1,250,000 gross, with a value, at 1939 prices, of 0.9–1.0 million dollars.

Duty reduced by 50 percent.—The share of imports in consumption would probably increase materially and might be 35–45 percent, or, say, 450,000–600,000 gross, with a foreign value of \$170,000–\$220,000. Domestic production, including exports, would probably be 850,000–1,100,000 gross. The unit value might decline somewhat on account of the increased competition of imports, and the total value might amount to \$650,000–\$825,000.

Duty increased by 50 percent.—Because of the brand prestige of certain imported pens, the share of imports in consumption would probably decline only moderately, perhaps to 17–20 percent, compared with 21 percent in 1939. Imports might thus range from 220,000 to 280,000 gross, with a foreign value (at 1939 unit values) of \$80,000–\$105,000. Production would then be slightly greater than under the first assumption as to rate of duty, say, 1,200,000–1,275,000 gross, valued at \$1,000,000–\$1,050,000.

Per capita income 75 percent higher than in 1939.

Perhaps half the use of pens is in connection with business operations, and consumption for that purpose tends to rise or fall with industrial activity and national income; consumption for other purposes, as in schools, is little affected by such changes. It is probable that the factors which during the pre-war decade were causing a reduction in per capita consumption will continue with sufficient strength to offset the increase in population. It seems unlikely, therefore, that even an increase of 75 percent in real income per capita would result in a consumption of pens exceeding that in 1939 by more than 25–40 percent, which would give a total consumption of 1.7–1.9 million gross.

Duty as in 1939.—The share of imports in consumption would probably be about the same as in 1939 (21 percent), or 350,000–400,000 gross, with a foreign value, assuming some advance in prices, of

¹ To avoid complexity, separate calculations of value of consumption are not made for different assumptions as to rates of duty and shares of imports in consumption.

perhaps \$150,000–\$160,000. It is doubtful whether United States exports would be materially greater than before the war, even with generally high levels of prosperity in foreign countries. In that case the domestic production (including that for export) would probably be 1,500,000–1,650,000 gross, with a value, at prices perhaps 10–15 percent higher than in 1939, of about \$1,350,000–\$1,500,000.

Duty reduced by 50 percent.—Assuming that imports would increase to 35–40 percent of consumption, they would amount to 600,000–850,000 gross, with a foreign value (at somewhat advanced prices) of about \$250,000–\$350,000. Assuming exports to be about the same as in 1939, domestic production might range from 1.1 million gross (minimum consumption with maximum percentage supplied by imports) to 1.4 million gross (maximum consumption with minimum percentage of imports), with a value of \$1,000,000–\$1,250,000.

Duty increased by 50 percent.—On the foregoing assumption as to the slightly reduced share of imports in consumption (17–20 percent), imports would probably be 300,000–375,000 gross, with a foreign value of \$125,000–\$150,000. Domestic production, including exports, might be 1,550,000–1,700,000 gross, with a value of \$1,400,000–\$1,550,000.

Exports

United States manufacturers have encountered severe competition in foreign markets, especially from Britain. The increase in exports during the present war, like that which occurred during the First World War, will probably be only temporary, and exports during the longer post-war term seem likely to be about the same as in 1939, more or less regardless of the degree of prosperity in foreign countries and of their policies regarding duties and trade restrictions.

Employment

Since the domestic industry is already highly mechanized, it is doubtful whether changes in methods of production in the post-war period, compared with pre-war years, would have great influence on employment. Consequently employment (in the sense of man-hours rather than number of persons on the pay rolls) will probably be more or less proportional to output. Output, in turn, as pointed out, will depend both on volume of consumption and on the proportion supplied by imports. On the basis of the extreme range of possible figures of domestic production given above, and assuming no change in working hours, post-war employment might range from about 350 (on the basis of a production of 1,150,000 gross) to about 550 (on production of 1,800,000 gross), compared with 370 in 1939.

ELECTRICAL APPARATUS, EXCEPT LAMPS

Tariff paragraph: 316, 320, 339, 353, 397.

Rates of duty: 17½% to 45% ad val.
(for a few items
compound rates are in
effect).

Equivalent ad valorem (1939): 31%
(average).

NOTE.—The articles covered by this report are provided for in the Tariff Act of 1930 under various classifications and rates of duty. The Revenue Act of 1932 imposed an import-excite tax, in addition to the tariff act duties, on the copper contained in imported articles, but copper is only a small part of the value of most electrical apparatus. The original tariff act rates were reduced on many items pursuant to trade agreements with Sweden (effective August 5, 1935), Netherlands (effective February 1, 1936), Switzerland (effective February 15, 1936), United Kingdom (effective January 1, 1936), and Canada (effective January 1, 1936, and January 1, 1939).

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	Export	For domestic market			
Value (\$1,000).....	2,127,635	109,520	2,018,115	1,830	2,019,945	Percent
Persons employed (number).....	350,000					0.09

¹ Landed value; foreign value was \$1,231,000.

The electrical manufacturing industry includes 20 or more branches, producing goods differing widely in character and in the conditions under which they are made and sold. There is some overlapping between the electrical and other industries in such products as vacuum cleaners, refrigerators, and other articles operated by electric motors and control devices. Several of these products are included in this discussion as they are made in large numbers by electrical manufacturers.

The relative importance of the principal groups of electrical products is shown in the following tabulation, which gives roughly comparable statistics of the value of production, exports, and imports in 1939.

Product	Production	Exports	Imports
	<i>1,000 dollars</i>	<i>1,000 dollars</i>	<i>1,000 dollars</i>
Engineering equipment.....	395,004	25,035	166
Home equipment and small motors.....	548,611	24,105	31
Radio apparatus.....	262,432	22,177	48
Insulated wire and cable.....	204,230	3,101	5
Batteries.....	111,219	6,457	7
Lighting fixtures.....	113,207	1,607	(²)
Wiring devices.....	109,140	3,679	30
Automotive electrical equipment.....	105,634	1,162	21
Telephone and telegraph equipment.....	94,495	3,659	54
Other.....	182,440	24,995	851
Total.....	2,127,635	109,520	1,220

¹ Foreign value.

² Not available, but not more than \$18,000.

There are nearly 3,000 manufacturers of electrical apparatus in the United States but, as in other leading industrial countries, a few large firms with extensive facilities for making both heavy equipment and other types of electrical goods occupy a commanding position in the industry. In 1939, the largest firm supplied about 17 percent of the total output of the United States industry. Other producers range in size from large enterprises to small shops making simple specialties.

The use of electrical equipment has grown tremendously for several decades because of the constant development of new applications for electricity, the lowering of prices, and the increasing supply and decreasing cost of electric power. The increase in consumption has not been unbroken, however, for sales have generally declined rapidly

when national income has diminished. With rising income, consumption tends to expand faster than income.

The manufacture of electrical goods for civilian use has been restricted during the war, but the industry has been extremely active in producing innumerable items for war industry and the armed forces. The value of only one group of products, electronic and related apparatus, has, in fact, been twice as large as the value of the total output of the electrical industry before the war. Many new products have been developed and many old ones improved during the war.

United States producers have by far the largest home market in the world for electrical goods. This has given them the opportunity to employ low-cost, mass-production methods and to make large outlays for research, which have kept the United States industry in the lead in respect to quality and progress in developing new products. Although these advantages apply unequally to different items, they have nevertheless been partly responsible for the fact that imports have been small, and far less than exports.

International agreements among producers have also been influential in determining the level of imports. Before the war the largest manufacturer in the United States was a party to a series of these agreements, which included the leading producers in five of the principal European countries and Japan. A pending complaint under the antitrust laws alleges that these agreements provided that none of the foreign parties should sell electrical equipment in the United States, and that the American company should not sell in the home countries of the other participants. The agreements were cemented by an extensive interchange of stock ownership. Another large United States electrical manufacturer was party to a similar, though less comprehensive, series of agreements.

The salient factors affecting the competitive situation of the principal branches of the electrical industry are discussed below:

Engineering equipment.—This group includes large generators and other equipment for public utilities and industrial firms. Much of this group, particularly the heavier units, can be made only by the largest firms in the industry, and this fact often gives these firms an advantage in the sale of other types. The high quality of domestic apparatus, the advantages of close contact between buyer and seller and ready access to the source of replacement parts, and the restriction of competition from the largest foreign builders by reason of international agreements, together with the protective duty, have nearly eliminated imports in this field.

Merchandising goods.—Examples of this group are small motors, refrigerators, household appliances, and radio sets. These goods are consumed in the United States in large numbers and are, therefore, adapted to mass-production methods. Foreign competitors are handicapped by the need for servicing facilities, which can be more readily established and maintained by domestic producers. Imports have been negligible in comparison with production.

Insulated wire and cable.—Telephone wire and cable is made mostly by a subsidiary of the principal telephone operating company. Other types are made principally by large electrical firms and subsidiaries of mining corporations. International agreements have affected imports of insulated wire, and partly for this reason imports have been very small.

Batteries.—Domestic storage batteries are of good quality and their prices are relatively low because they are made in great numbers by mass-production methods which minimize the amount of hand labor. This reason and the fact that some automobile manufacturers are affiliated with domestic battery producers have kept imports small. There is a possibility also, that understandings among manufacturers have restricted international trade, although large electrical firms which have been the most conspicuous adherents to these arrangements do not make storage batteries.

Primary cells (such as dry batteries) are made in the United States either by machine or hand, depending on the size of the cell. They are made by hand in a number of foreign countries where wage rates are low; but the quality does not usually meet United States standards. Imports have been very small.

Automotive electrical equipment.—Subsidiaries of the automobile builders and other firms in close contact with them make this equipment. Imports are small and are unlikely to increase much even if the duty were reduced by 50 percent.

Telephone equipment.—A subsidiary of the principal operating telephone company is the outstanding manufacturer of telephone apparatus. Imports, which are small, are mostly for the Puerto Rican telephone system, and unlikely to expand.

Wiring devices, lighting fixtures, flashlights, and similar goods.—These products are simple, and do not require much technical knowledge or expensive equipment for production. For this reason foreign producers may have a cost advantage over domestic because of lower wage rates. Apart from the duty, the fact that building regulations in the United States have established standards for many of these devices which cannot be met by the foreign articles has tended to limit imports.

X-ray apparatus.—The United States has at times imported substantial amounts of X-ray equipment because some buyers have favored a certain foreign make. This firm, however, is now producing in the United States.

Unclassified articles.—The foregoing classes of goods represent by far the greater part of the electrical industry. However, one-third to one-half of the imports are reported as machines with electrical elements, or as miscellaneous electrical goods. Much of this material was no doubt of the specific classes discussed above, which apparently was not properly classified at the time imported because of insufficient description. The remainder of the imports classified as "other" in the above table consists of a great variety of novelties, components for various apparatus, special devices, and electrically operated machines of many kinds. These imports are probably least affected by intercompany affiliations, but are in direct competition with domestic products only to a slight extent.

POST-WAR SHORT TERM

Consumption is likely to be large, owing to the deferred demand for consumer goods and the probability of continued expansion of power projects.

In 1939 about 70 percent of the imports of electrical goods, other than lamps, came from Germany. It seems unlikely that the former place of Germany in the United States import trade will be taken by

other European countries. Therefore, imports are likely to be even smaller than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

The following estimates regarding the effect of a continuance of the 1939 rates of duty or of 50 percent changes in those rates take into account two entirely different possibilities: (1) That the pre-war agreements and similar arrangements between large domestic and foreign electrical manufacturers will continue and will restrict trade in about the same measure as before the war, and (2) that no such arrangements will exist, or that, if they do, they will be much less restrictive on the import trade than before the war.

Under the first assumption, with duties at the 1939 level, imports would probably be about the same proportion of consumption as in 1939. A reduction of 50 percent in duties would have relatively little effect on imports of the classes of goods which constitute the bulk of the consumption, although it might result in a considerable increase in the trade in other classes which, though constituting the greater part of the pre-war imports, represent only a relatively small fraction of the total consumption of electrical goods.

Under the second assumption regarding international agreements, imports even at the 1939 level of duties might be a materially larger proportion of consumption than before the war, since imports of heavy and standardized articles might become of appreciable importance. A 50 percent reduction in duties might increase by a very large percentage the imports of such articles, as well as increasing the imports of the other types. Even under this assumption, however, imports would probably be a small fraction of 1 percent of total consumption, because of the competitive advantages of the American industry, which have already been set forth, especially in regard to heavier and more standardized articles.

All the estimates of imports presented below are expressed in the form of a range, the lowest figure representing the estimate of the minimum amount of imports which would be likely to enter if international agreements and similar arrangements continue in effect; the highest figure represents the estimated maximum amount of imports if these arrangements should be nonexistent or be but little restrictive on trade. These estimates are summarized in the table below.

Electrical apparatus (except lamps): Estimates of post-war consumption and imports under the assumptions of Senate Resolution 341

[In millions of dollars]

Period, income level, and tariff treatment	Consumption ¹	Imports ²
1939.....	2,020	1.2
Post-war long term:		
Per capita income as in 1939:		
Duty as in 1939.....	2,500-3,000	1.5-3.5
Duty reduced by 50 percent.....		2.2-5.0
Duty increased by 50 percent.....		1.0-2.5
Per capita income 75 percent higher than in 1939:		
Duty as in 1939.....	4,000-5,000	2.4-5.6
Duty reduced by 50 percent.....		3.2-8.0
Duty increased by 50 percent.....		1.6-4.0

¹ Slightly exceeding production for the domestic market.

² Foreign value.

Since under any assumption regarding duties or international agreements the imports are not likely to exceed one-fifth of 1 percent of consumption, it is not worth while to estimate different figures for production for the domestic market, or for total consumption, under the several duty assumptions.

Per capita income at the 1939 level.

Per capita consumption of electrical equipment would probably be somewhat larger than in 1939, since expansion in the applications of electricity is likely to continue and charges for electric current to decline further. Wartime developments have hastened the trend toward new applications of electricity, particularly in the vast field of electronics. Taking account of population growth, the value of consumption (at 1939 price levels) may amount to 2.5-3.0 billion dollars, or 25-50 percent more than in 1939.

Duties as in 1939.—Imports might range from about the 1939 figure to 2 or 3 times as much, depending on the situation as to international agreements. They might be 1.5-3.5 million dollars (foreign value).

Duties reduced by 50 percent.—Imports might be 40-50 percent greater than with duties as in 1939, perhaps 2.2-5.0 million dollars (foreign value).

Duties increased by 50 percent.—Imports might be 30-40 percent smaller than with no change in duties, and be within the range of 1.0-2.5 million dollars, depending on the situation with respect to international agreements.

Per capita income 75 percent higher than in 1939.

The consumption of producers' goods and durable consumers' goods in general might readily increase, even in terms of quantities, parallel with the increase in real (as distinguished from money) income, and electrical products would probably share fully in this expansion. In view of an increase in prices of probably 10-15 percent, it seems likely that the value of consumption of electrical goods might be 50-75 percent greater than with income as in 1939, and might amount to 4-5 billion dollars. Imports would presumably represent approximately the same ratio to consumption, under the several assumptions regarding duties, as estimated above on the basis of per capita income the same as in 1939.

Exports

Exports have been affected by the same international agreements among producers that have restricted imports, but to a less extent, as in many cases only the home and adjacent territories of large producers are governed, leaving large markets outside of the unrestricted countries.

Although often at a disadvantage in respect to wage rates, United States manufacturers have in their favor high quality, low costs because of mechanization and mass production, and in some cases international financial affiliations. However, many buyers in export markets do not value quality as highly as it is valued in the United States and parts of Europe. Moreover, the tendency of United States firms to establish branch plants in countries where the demand became large and duties are relatively high has also affected export trade adversely. Exports have been largest in merchandising (mass-production) goods. Latin America is the largest outlet for United States exports.

It seems probable that in the long-term period at the same world-income level, exports might be somewhat above those of 1939, and, with increasing development of demand in countries which produce little or no electrical apparatus, might be perhaps 125 million dollars. With a higher world income and reduced trade barriers, they might reach 175-200 million dollars, and might be still higher if unrestricted by manufacturers' agreements.

Employment

Employment will probably vary in about the same ratio as production. With income at the 1939 level, it might be about 450,000 and, at the higher income level, perhaps 750,000.

CUTLERY—HOUSEHOLD AND TRADE

Tariff paragraph: 355.

Commodity: Table cutlery, butchers', kitchen, and artisans' knives, and related cutlery, including blades without handles.

Rate of duty: Specific rates of 2¢, 4¢, 8¢, 10¢, and 16¢ each, depending upon the handle material and the length of the blade, plus 25%, 35%, or 45% ad valorem. *Equivalent ad valorem (1939):* 47%

NOTE.—The rates fixed in the Tariff Act of 1930 were 2, 8, or 16 cents each, depending upon handle material and length of blade, plus 45% ad valorem. These rates were variously reduced, effective January 1, 1939, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	1 26,000	396	25,604	355	25,900	1.4
Persons employed (number).....	1 6,000					

¹ Estimated.

² Landed value; foreign value was \$226,000.

The United States produces cutlery of all kinds. Many articles are made by machine in a comparatively few simple patterns for which the demand in the United States is sufficiently great to permit mass production. These articles include certain types of table cutlery, kitchen cutlery, and some kinds of trade knives. Domestic manufacturers hold practically the entire domestic market and are substantial exporters of some of these products. Other articles require a large amount of skilled manual labor, and the demand is not sufficiently great to permit mass production. Foreign manufacturers of

some of these products are important participants in the United States market.

About 25 percent of the total quantity and 50 percent of the total value of imports in 1939 consisted of relatively high-priced table cutlery and trade specialties, whereas the remainder consisted of ordinary table, kitchen, butcher, and similar cutlery with considerably lower unit values. In domestic production, sterling silver cutlery accounted for about 20 percent of the total value, silver-plated cutlery for about 50 percent, butchers' knives and cleavers for 8 percent, and other types of table, kitchen, and other cutlery, for about 22 percent.

Germany and the United Kingdom have been the principal suppliers of imports, but imports from other European countries have been important.

During the war output of luxury types of cutlery has been curtailed; imports have declined to a low level; and exports have expanded, going largely to Western Hemisphere markets.

POST-WAR SHORT TERM

Production and consumption of household and trade cutlery will no doubt be large for 2 or 3 years at least after the war. In particular, production for civilian use of good grades of table cutlery has been severely curtailed during the war and a large backlog of demand exists. Dealers' stocks have been practically exhausted in some lines. Imports are not likely to reach any appreciable volume for some time after the war, and if the experience after the last war should be repeated, there will be a substantial demand from foreign countries for household and trade cutlery of American manufacture.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption in the post-war long-term period is likely to show little change from the 1939 level per capita but to reflect the general increase in population; it might be 25-30 million dollars. Changes in duty would not have any marked effect on total consumption, although they might appreciably affect consumption of some types. They would, however, be reflected in the proportions supplied by imports.

Duty as in 1939.—Many of the duties applying to cutlery were reduced at the beginning of 1939, but the trade in that year probably did not fully reflect the long-run result of these changes. Imports in the long run might, therefore, represent a somewhat higher share of consumption than in 1939, amounting, perhaps, to a foreign value of \$300,000-\$350,000.

Duty reduced by 50 percent.—A reduction in duty might result in considerably greater imports of certain types of cutlery in the lower-priced brackets, in which competition is most keen. Imports of this portion of the trade would perhaps double in value, and total imports might rise to \$400,000-\$450,000 (foreign value).

Duty increased by 50 percent.—This increase would affect imports of the medium- and low-priced articles much more than those of specialties and prestige wares. Imports might amount to \$150,000-\$200,000.

Per capita income 75 percent higher than in 1939.

In quantity, the per capita consumption of cutlery would increase somewhat with an increase in income, and there probably would be a decided increase in the proportion of higher-priced articles sold, so that value of consumption might be 30-40 percent greater than with an unchanged income, and might amount to 35-40 million dollars. Since luxury articles constitute a larger part of imports than of domestic production, the effect of high income would probably be to increase imports by a somewhat higher percentage than domestic production. As stated above, changes in duty would have little effect on total consumption although they might affect materially the consumption of some types and the share of imports in consumption.

Duty as in 1939.—Imports would probably supply a little higher proportion of consumption than at the lower income level; they might amount to between \$500,000 and \$600,000 (foreign value).

Duty reduced by 50 percent.—Under these conditions imports might amount to \$650,000-\$750,000. Increased foreign competition would be expected both in ordinary types of cutlery and in prestige wares.

Duty increased by 50 percent.—Imports of high-grade specialties or luxury items, with high national income, would be sold in this market in considerable quantities irrespective of the higher prices which might result from a duty increase. Total imports might, therefore, still be valued at \$300,000-\$400,000 (foreign value).

Exports

Under ordinary circumstances the principal export markets for table and kitchen cutlery of domestic manufacture are Canada, Cuba, South and Central America, Mexico, and the Philippines. Very little expensive cutlery is exported. Until European producers again become active in foreign trade it is possible that United States exports, largely because of the accumulated demand, may rise to a high level. In the long run, however, exports are likely to return to pre-war levels and amount to \$400,000-\$500,000 annually, being affected to some extent by the level of income in the foreign countries to which the exports go.

Employment

Employment in this industry does not vary greatly with moderately increased output since many of the manufacturing processes are highly mechanized and production can be readily accelerated. The industry requires a relatively high proportion of specialized skilled labor, especially in the manufacture of sterling silver tableware. At a high level of demand total employment might be 7,000-8,000 persons.

SURGICAL AND DENTAL INSTRUMENTS

Tariff paragraph: 359.

Commodity: Surgical and dental instruments.

Rate of duty: 70%, 60%, 55%, and 35% *ad valorem*. *Equivalent ad valorem (1939):* 48% (average).

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	8,956	671	8,285	1,655	9,140	Percent 10
Persons employed (number).....	2,500-3,000					

1 Landed value; foreign value was \$524,000.
 2 Estimated.

The articles covered in this report are hard and soft metal surgical and dental instruments, including hypodermic syringes (partly of metal), dental burrs, and instrument attachments for dental engines.

Surgical instruments accounted for 80 percent of the value of production of these articles in 1939, and dental instruments for 20 percent. Imports amounted to \$800,000 (foreign value) in 1937 and the 5-year average for the period 1935-39 was about \$640,000. It is estimated that 20-30 percent of the imports consists of special types of instruments required only in very small lots. The principal items imported in 1939 were dental burrs (27 percent of the total), surgical and dental forceps (25 percent), and hypodermic syringes (10 percent). Germany was the principal source, providing 65 percent of the total, and Sweden, Japan (almost entirely hypodermic syringes), and the United Kingdom each supplied about 10 percent.

POST-WAR SHORT TERM

The war very greatly increased the requirements for surgical instruments and also for dental instruments. It is probable that considerably larger quantities of both may be consumed than in 1939. Probably imports may be smaller than in 1939 because of the large demand for instruments in the principal producing foreign countries, and on account of the time that will be required before some countries resume production on a large scale.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

With increased population and more emphasis upon improvement in the general health, the value of domestic consumption might be 15 percent greater than in 1939 and amount to 10.5 million dollars. Changes in rates of duty would not affect consumption appreciably.

Duty as in 1939.—Imports might supply 12 percent of domestic consumption, or 1.3 million dollars, landed value (\$800,000, foreign value). Production, then, for the domestic market might be 9.2 million dollars.

Duty reduced by 50 percent.—A lower duty would probably increase imports substantially, particularly of the higher-priced instruments. Imports might be 50 percent more than if 1939 duty rates prevailed and be about 19 percent of domestic consumption or nearly 2 million dollars, landed value (1.2 million dollars, foreign value). Production for the domestic market then might be 8.5 million dollars.

Duty increased by 50 percent.—This increase in duty would probably have little effect upon imports of specialties, but might result in a substantial reduction in imports of standard types. Imports might be nearly 8 percent of domestic consumption or about \$800,000 landed value (\$500,000 foreign value).

Per capita income 75 percent higher than in 1939.

Under a higher national income, a great deal more would probably be spent for medical and dental care, resulting in a substantial increase in consumption of surgical and dental instruments. The value of consumption might be 35 percent greater than if per capita income of 1939 prevailed, and amount to about 14 million dollars.

Duty as in 1939.—Imports might be about 12–13 percent of consumption, or, say, 1.8 million dollars, landed value (1.1 million, foreign value). Production for the domestic market then might be 12.2 million dollars.

Duty reduced by 50 percent.—Imports might be 18–19 percent of consumption, or; say, 2.6 million dollars landed value (1.6 million dollars foreign value), or about 45 percent more than with unchanged duties. Production for the domestic market then might be 11.4 million dollars.

Duty increased by 50 percent.—Imports might be 8 percent of consumption or 1.1 million dollars landed value (\$700,000 foreign value). Production for the domestic market then might be 12.8 million dollars.

Exports

United States exports of surgical and dental instruments amounted to nearly \$700,000 in 1939, of which surgical instruments accounted for 93 percent. The United Kingdom and Canada took about 45 percent of the total and the Union of South Africa, Mexico, China, Venezuela, and Cuba together received 20 percent. It seems probable that the value of exports will be much greater in the post-war years.

During the war most of the Allied countries have obtained large quantities of surgical instruments from the United States for military and emergency needs. Exports averaged nearly 3 million dollars for the period 1941–43, or over four times the value in 1939. It seems reasonable to expect that these wartime exports will result in larger foreign markets after the war, as experience shows that surgeons are strongly inclined to purchase for replacement, types and styles of instruments to which they have been accustomed. It is possible that post-war exports might amount to 1.5 million dollars if the per capita national income is at the 1939 level, and to 2.5 million dollars if the income is at the higher level.

Employment

Of the 50–60 concerns engaged in the manufacture of surgical and dental instruments, apparatus, and supplies in the United States during 1939, probably 40–60 percent produced instruments. There were three to five relatively large concerns; the others were smaller, some shops employing only 1 to 5 men. It is estimated that there may have been 2,500–3,000 persons engaged in instrument production in 1939. After the war, employment will probably increase proportionately to the increase in production; 2,800–3,200 may be employed if the 1939 income prevails, and 3,000–3,500 at the higher income level.

FILES

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
362-----	Files, rasps, and floats:		
	2½" long and under-----	20¢ per doz-----	14%.
	Over 2½", not over 4½" long-----	25¢ per doz-----	16%.
	Over 4½" and under 7½" long-----	35¢ per doz-----	21%.
	7" long and over-----	45¢ per doz-----	15%.

NOTE.—Floats are single-cut files, usually coarse. As fixed in the Tariff Act of 1930 the rates on the items shown above were, respectively, 25¢, 47½¢, 62½¢, and 77½¢ per dozen. The reduced rates shown above became effective pursuant to the trade agreements with Sweden, effective August 5, 1935, and Switzerland, effective February 15, 1936.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 doz.)-----	17,268	2,130	5,138	55	5,193	Percent 1.1
Value (\$1,000)-----	11,470	2,510	8,960	2106		
Unit value (per doz.)-----	\$1.58	\$1.18		\$1.92		
Persons employed (number)-----	3,250					

¹ Partly estimated.

² Foreign value.

Files and rasps, used in working metals, wood, and other hard substances, are made in thousands of patterns, sizes, and cuts. Files 7 inches or over in length are mostly for ordinary shop use; those under 7 inches are largely precision-type files used by watchmakers, jewelers, die sinkers, and other craftsmen.

All types of files are produced in the United States, but ordinary files 7 inches and over in length predominate. From trade reports it is estimated that less than 10 percent of the domestic output consisted of precision files. Imports consist chiefly of precision files under 7 inches long, which are supplied mostly by two Swiss firms, and have a duty-paid value 50 percent or more above the average for all sizes in domestic production. Imports of files 7 inches long and over are chiefly from Sweden. In the period 1936-39, imports averaged 52,000 dozen a year valued at \$103,000.

Over 98 percent of United States consumption is supplied by about 20 domestic firms who are primarily engaged in the manufacture of files and rasps, and in recutting and resharpening files. During the war, United States production and exports, because of the requirements of war industries, have increased substantially. An output of 8 million dozen files valued at approximately 13 million dollars has been fairly representative of peacetime production in peak years of business activity. By 1943, however, production had risen in value to 24.5 million dollars under the stimulus of war demand. Consumption is closely associated with the scale of industrial activity.

The United States is in a strong competitive position with respect to both home and foreign markets in standard sizes of files and certain manufacturing specialties. Competition from foreign producers, both here and abroad, has been confined largely to small precision-type files where highly skilled labor requirements are most exacting.

POST-WAR SHORT TERM

Annual domestic production in the United States will probably decline in some lines for a year or two after the war as demand from war industries decreases, but will no doubt be offset to some extent by the demand for types of products required in peacetime production, so that output will presumably be much above pre-war levels. Precision-type files from Switzerland will also probably be in somewhat greater demand as producers of luxury goods again become active.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of files will probably level off after the short-term post-war period, but with a 10 percent increase in population, consumption will probably rise proportionately, or to about 5.7 million dozen valued at about 10 million dollars. Exports might rise to about 2.4 million dozen valued at about 2.8 million dollars; domestic production of about 8 million dozen valued at approximately 13 million dollars would possibly be required to meet the demand. Production and consumption would probably be little affected by a 50 percent change of the duties in either direction.

Duty as in 1939.—Imports would probably be about 10 percent higher than in 1939 in keeping with the rise in population and amount to about 60,000 dozen with a foreign value of about \$115,000.

Duty reduced by 50 percent.—Imports would perhaps increase about 40 percent above their 1939 level and amount to perhaps 80,000 dozen, with a foreign value of perhaps about \$155,000. Such an increase in imports would result from a greater demand for Swiss files by a larger proportion of the domestic industries using precision files, which could perhaps purchase them at lower prices than similar domestic files, by reason of the cut in duty.

Duty increased by 50 percent.—Imports might be 10 to 15 percent less than with no change in duty and might decline to about 50,000 dozen valued at about 95 thousand dollars.

Per capita income 75 percent higher than in 1939.

Inasmuch as files are required in practically every manufacturing activity, United States consumption would perhaps rise commensurately with the increase in per capita national income, to about 9 million dozen, and be valued at about 16 million dollars, assuming some increase in the general price level. At the higher income level, with increased foreign industrial activity, exports might increase to 3 million dozen with a value of approximately 3.9 million dollars, resulting in domestic production of about 12 million dozen valued at about 20 million dollars to satisfy domestic and foreign requirements.

Duty as in 1939.—Imports might be around 70 percent greater in quantity than with an unchanged income, amounting to 100,000 dozen valued, on the basis of a 10 percent higher average unit value, at about \$210,000 (foreign value); the quantity would be about 85 percent greater than in 1939.

Duty reduced by 50 percent.—Imports might rise to a level about 135 percent higher than in 1939, or to 130,000 dozen, valued at about \$275,000. The lowered duty would affect principally the precision-file class.

Duty increased by 50 percent.—Imports would be probably about 10 percent higher than in 1939, or 80,000 dozen, with a foreign value of possibly \$165,000.

Exports

The United States is one of the leading exporters of files, about one-third of the annual output being exported. In the period 1936–1939, annual exports averaged 1.9 million dozen, valued at 2.2 million dollars. In 1941, there were exported 2.6 million dozen, valued at 3.9 million dollars. The United States has important markets both in files less than 7 inches long and 7 inches or longer. In 1939, exports consisted of 1.3 million dozen files less than 7 inches long, valued at 1.1 million dollars, and of slightly less than one million files 7 inches or longer, valued at 1.4 million dollars. The leading markets in that year were British India, Mexico, Netherland Indies, Colombia, and Canada. Under the most favorable post-war conditions, United States exports might rise to 3 million dozen.

Employment

Immediately after the war employment will probably decline somewhat from a relatively high wartime level to 3,500–4,000 workers. With a decline in per capita national income to the 1939 level and accompanying slackened manufacturing activities, employment would probably be between 3,000 and 3,500 workers. If the per capita national income later should rise 75 percent above 1939, employment might increase to about 5,000 persons.

SHOTGUNS

Tariff paragraph: 365.

Commodity: Shotguns.

Rates of duty: Various.

Equivalent ad valorem (1939): 39%
(average).

NOTE.—The rates fixed in the Tariff Act of 1930 for these classifications were:

Value not over \$5 each.....	\$1.50 each plus 45 percent ad valorem.
Value over \$5, not over \$10 each.....	\$4.00 each plus 45 percent ad valorem.
Value over \$10, not over \$25 each.....	\$6.00 each plus 45 percent ad valorem.
Value over \$25, not over \$50 each.....	\$10.00 each plus 45 percent ad valorem.
Value over \$50 each.....	65 percent ad valorem.

These rates were reduced 50 percent pursuant to the trade agreement with Belgium, effective May 1, 1935.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000).....	496	43	443	19	462	Percent 4.2
Value (\$1,000).....	6,102	359	5,743	1,387		
Unit value (each).....	\$12.55	\$8.30	\$12.96	\$30.00		
Persons employed (number).....	2,100-2,200					

¹ Foreign value.

Shotguns were produced by 14 establishments in the United States in 1939. The output consisted of single-barrel single-shot, single-barrel repeaters (automatic), and double-barrel sporting shotguns. The Census of Manufactures for 1939 does not show data covering repeating shotguns separately. In 1937 repeating shotguns accounted for 30 percent of the number and 51 percent of the value of the total shotgun output. In 1937 the average unit value for repeating models was \$22.40; for single-barrel single-shot models, \$5.24; and for double-barrel models, \$20.40. The average unit value in 1937 for all models was \$13.20 compared with the average of \$12.55 in 1939.

Imports in the period 1927-39 were very largely an American patented automatic gun made under contract by a Belgian concern. In 1939 this type of gun accounted for 99 percent of the total number. The foreign value of these guns was about \$20 each. The few other shotguns imported were very high in value (\$500 to \$1,000 each), being hand-finished. These are purchased almost exclusively by very wealthy hunters, and it is unlikely that the demand for them will be affected substantially by changes in duty rates or by either high or low per capita income. The reduction of 50 percent in the duty rates which became effective in 1935 appears to have had no effect on the importation of these high-priced guns, nor did it result in any appreciable imports of very low-priced guns.

POST-WAR SHORT TERM

Only a small number of shotguns have been made during the war and these are distributed under priorities for the purpose of keeping down wild animals which destroy crops. It seems probable that there will be a large unfilled demand, and that consumption may be considerably above that of 1939. It seems doubtful whether the Belgian producers will be in a position to resume manufacture for some time after the war; if not, imports may be insignificant.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

By reason of increase in population, domestic consumption may be slightly over a half million shotguns.

Duty as in 1939.—Assuming that the Belgian concern which was the principal source of United States imports in the 1930's holds its pre-war contract status, imports may amount to 4 percent of domestic consumption, or about 21,000 shotguns, with a foreign value of about \$425,000 (averaging about \$20 each). Production for domestic consumption might be about 490,000, valued at about 6.3 million dollars (average unit value about \$13).

Duty reduced by 50 percent.—Although domestic users appear to make their purchases on the basis of performance of trade-name guns rather than on price, this reduction in duty might bring about the importation of a few thousand guns of lower price than those imported before the war (foreign value ranging from \$4 to \$8), and also an increase of perhaps 3,000 guns in imports of the automatic type in the \$10 to \$25 range (foreign value). Imports might aggregate nearly 6 percent of domestic consumption, or about 30,000 shotguns, with a foreign value of about \$500,000 (averaging \$16 to \$17 each). Production for domestic consumption then might be about 480,000 guns, valued at 6.2 million dollars (average unit value \$13).

Duty increased by 50 percent.—Imports of all types under \$10 each (foreign value) would probably be insignificant (as before the war); the number of automatics imported might fall to about 10,000. Total imports might amount to about 2 percent of domestic consumption, or 10,500 guns, having a foreign value of \$225,000 (averaging about \$22 each). Production for domestic consumption then would probably be nearly a half million guns valued at about 6.5 million dollars (average unit value about \$13).

Per capita income 75 percent higher than in 1939.

Consumption might be 20 to 30 percent greater in number than at the lower income level, or 640,000 units. Prices of standard domestic and foreign makes would probably rise 10 to 15 percent. The proportion of high-priced guns sold would also rise.

Duty as in 1939.—Imports might increase in number at about the same rate as consumption, but high-priced hand-made models would increase more than machine-made, so that the average value would rise appreciably. Imports might be about 4 percent of domestic consumption, or 27,000 guns, with a foreign value of about \$675,000 (average unit value \$25). Production for domestic consumption might be 610,000, valued at about 9.5 million dollars (averaging about \$15.50 each).

Duty reduced by 50 percent.—With higher income it seems unlikely that any greater quantity of low-priced foreign guns of unknown performance would be sold than at the 1939 income level. Accordingly, imports would probably be principally of medium-priced guns; the limited number of high-priced gun imports would scarcely rise with a reduction in duty. Total imports might amount to 5.5 percent of domestic consumption, or around 36,000, with a foreign value of

\$900,000 (averaging about \$25 each). Production for domestic consumption might be around 600,000, valued at 9.4 million dollars.

Duty increased by 50 percent.—As this would raise the average ad valorem from about 40 percent to 60 percent, imports of guns in the \$10 to \$25 (foreign value) price brackets would probably be considerably less than with duties as in 1939. It seems unlikely that high-priced guns would be greatly affected. Total imports might amount to 2 percent of domestic consumption, or about 13,000 guns, with a foreign value of about \$325,000. Production for domestic consumption might be about 630,000 valued at nearly 10 million dollars.

Exports

United States exports of sporting firearms were for a number of years twice as great as the number imported. However, exports have been largely in the lower price brackets so that the total value has been about the same as the value of imports. The average unit value of exports in 1939 was \$8.30, and in the 5-year period 1935-39 was \$8.70. English-speaking countries are the principal markets. It seems reasonable that changes in exports may about parallel changes in domestic consumption and may be 45,000 to 50,000 guns valued at \$380,000 to \$420,000 with per capita income at the 1939 level. With a higher income level, more guns may be exported, including a larger number of the higher-priced models so that exports may amount to about 60,000 guns valued at about \$600,000 (averaging \$10 each).

Employment

Shotguns were produced in 14 establishments in 1939, including manufacturing concerns, their subsidiaries and branch plants. Most firms make other firearms such as rifles, revolvers, and pistols at the same plants and report employment for the aggregate output. It is estimated from such trade data as are available that from 2,100 to 2,200 workers were engaged in shotgun output in 1939. With slightly greater production after the war at the 1939 income level, from 2,300 to 2,400 might be employed, and the number might increase to 2,500 to 2,600 in the post-war long term with income at the higher income level.

WATCHES AND WATCH MOVEMENTS

Tariff paragraph: 367.

Commodity: Watches and watch movements.

Rates of duty: Various.

Equivalent ad valorem (1939): 63% (average).

NOTE.—The rates fixed in the Tariff Act of 1930 for watch movements having not more than 17 jewels ranged from 75¢ to \$2.50 each, according to 7 sizes, with an additional duty of 15¢ for each jewel in excess of 7. Additional charges of \$1 each were provided for each adjustment and for any movement operating in excess of 47 hours without rewinding or if self-winding. For movements having more than 17 jewels the act provided a flat rate of \$10.75 each. A number of compound rates were provided for watch cases.

The basic rates and additional duties on movements with up to 17 jewels and the rates on cases were reduced pursuant to trade agreement with Switzerland, effective February 15, 1936. On the basis of imports in 1939, the duty reductions averaged approximately 38 percent.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production, domestic movements			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
<i>All watches:</i> ¹						Percent
Quantity (millions).....	12.0	0.4	11.6	2.9	14.5	20
Value (million dollars).....	36.5	.6	35.9	8.1		
Unit value (each).....	\$3.04	\$1.50	\$3.10	\$2.76		
<i>Watches without jewels:</i>						
Quantity (millions).....	9.0	.4	8.6	(?)	8.6	(?)
Value (million dollars).....	6.2	.3	5.9			
Unit value (each).....	\$0.69	\$0.82	\$0.68			
<i>Jewel type watches:</i> ¹						
Quantity (millions).....	3.0	(?)	3.0	2.9	5.9	49
Value (million dollars).....	30.3	.3	30.0	8.1		
Unit value (each).....	\$10.10	\$11.73	\$10.00	\$2.76		

¹ Quantity figures are in terms of movements produced in the United States and imported. Of the estimated domestic production, the bulk consists of cased watches and the value figures include the value of the cases. Of the imports in 1939 only about 7 percent were cased watches and the value of these cases has not been added to that of the movements. Watch parts as such are not included in any of the figures; data on quantities are not available; imported parts are largely for replacements and repairs.

² Foreign value.

³ Negligible.

⁴ "Jewel type watches," as used here, include both those of plate and bridge-type and those of clock-type construction, if jewels are used as bearings.

⁵ About 25,000.

The domestic watch industry may be said to comprise three branches, as follows: Manufacturers of jeweled watch movements and complete watches, of nonjeweled watches, and of watchcases. The aggregate value of production in 1939 of watches, movements, and parts, as recorded in the Census of Manufactures, was 52 million dollars, a figure involving considerable duplication. This value includes a considerable number of imported movements on which additional work was done in the United States by large assemblers, including the value of cases. Based on estimates made from available published data, the jeweled watches produced in the United States (for domestic consumption) from American movements, which comprise the bulk of the United States watch output directly affected by imports, amounted to 3 million watches, with an estimated value of a little more than 30 million dollars (averaging \$10.10 each). The remaining 8.5 million watches with American movements, produced for domestic consumption (referred to in this report as "nonjeweled watches"), had a total value of about 6 million dollars (averaging 70 cents each). From 10 to 15 percent of the nonjeweled watches were of higher quality than the others and their estimated average unit value was about \$1.50; the remainder (about 7.5 million watches) had an average unit value of about 60 cents each.

About half of the output of the domestic watchcase industry in 1939 (totaling a little under 6 million units) was purchased by producers of domestic jeweled watches, or acquired through interplant transfer, and their value is included in the value of United States jeweled watches. A substantial number of the imported jeweled movements were cased in the United States by a few large concerns which produce watchcases. However, a greater number of the imported movements, it is believed, were cased by assemblers and distributors, who are classed as wholesale distributors and not manufacturers. The relative quantities and values of the cases produced are helpful in comparing values of complete United States watches with imported movements.

About 4.5 percent of the total number of cases manufactured in the United States were platinum, gold, or silver, and these accounted for 23 percent of the total value of the domestic watchcase output; 22 percent of the number and 41 percent of the value were "filled" or plated with precious metals; and the remainder—73 percent of the total number but only 36 percent of the total value—were predominantly composed of base metal alloys. The average values per case in these three broad groups, each composed of a variety of sizes and weights, were about \$8, \$3, and 80 cents, respectively.

Separate data on the value of domestic-made watches and movements are not available; nor are there any data on watches or movements by principal jewel classifications. Domestically produced jeweled watch movements consist very largely of movements having 7 or more jewels. Predominant types are those containing 15 or 17 jewels. Based on official statistics of the Census Bureau, it is seen that jeweled watches made with purchased cases in establishments producing the movements had an average value of approximately \$14.24 each. The average value of jeweled watches made in establishments producing both the movement and the case, together with a comparatively small number of movements produced for sale separately, was about \$5 each.

Imports of jeweled watch movements are almost exclusively from Switzerland, only about 0.2 percent of the total number imported in 1939 coming from France and other countries. In that year imports of watch movements totaled 2,919,000 units, with an aggregate foreign value of \$8,058,000 (average unit value \$2.76). Of the total imports only about 7 percent, or approximately 212,000, were imported with cases, the separate foreign value of the cases being about \$350,000 (average unit foreign value \$1.63). Nearly 90 percent of the imported cases were of base metal, with an average foreign unit value of about 80 cents.

The general pattern of imports of watch movements in 1939 was as follows: With the exception of possibly 50,000 to 100,000, all the imported movements were models having 1 to 17 jewels, inclusive. About 41 percent of the imports were 6- and 7-jewel models, whereas 17-jewel models accounted for 42 percent. More than two-thirds of the entire number imported were wrist-watch movements more than 0.6 inch, but not more than 0.8 inch, in width. Among wrist-watch movements, about 835,000 (averaging \$3.29 each, foreign value) were 17-jewel classifications; 150,000 (averaging \$3.27 each, foreign value) were 15 jewel; 829,000 (averaging \$2.17 each, foreign value) were 6 or 7 jewels; and 151,000 (averaging \$1.25 each, foreign value) were models with 1 or no jewel.

Before the war, United States imports of Swiss watch movements were materially higher in quality and of better finish than the average of those exported by Switzerland to other large consuming countries. While detailed data concerning watch production are not published by Switzerland, 90 to 95 percent of the number of watches and movements manufactured are understood to be for export. Of the total number of watches exported in each of the 3 years, 1937-39, nearly 25 percent, or an average of about 2.6 million, were wrist watches with cases of base metal, having an average unit value in Switzerland of 70 to 75 cents; and 1.2 million were pocket watches with cases of base metal, having an average unit value in Switzerland of 40 to 45 cents.

Practically no watches of these cheap types were exported to the United States. However, it is significant that the Swiss industry has the factory capacity to manufacture these low-priced timepieces, which might be sold in the United States in competition with the domestic output of nonjeweled watches.

For the immediate pre-war period, the year 1939 appears fairly representative for both domestic production and imports. However, in 1937 total imports of watch movements from Switzerland exceeded 3.1 million units, as against 2.9 million in 1939, and in each year since 1939 they have been materially in excess of 3 million units, increasing from 3.5 million in 1940 to almost 8 million in 1943. A significant change in the character of the imports during these years is the very pronounced increase after 1941 in the number of finished watches; that is, of movements in cases. In 1942 the proportion of case movements to the total number of movements from Switzerland was 21 percent, and in 1943 it was 37 percent, compared with an average of approximately 7 percent for the pre-war years.

The explanation of the large wartime importation of watches lies principally in the fact that since about the middle of 1942, only precision watches for use by military and railway personnel and a very small number of clock-type watches have been produced in the United States. The domestic jeweled-watch industry has been engaged in the manufacture of military precision timepieces and instruments, and the nonjeweled-watch industry has devoted itself to quantity production of certain military devices and precision parts.

POST-WAR SHORT TERM

The domestic jeweled-watch industry estimates that a period of 9 months after the close of the war may be required to reconvert their plants and equipment to the manufacture of watches for civilian requirements. Two or three months more may elapse before the finished products are well distributed in consumption channels.

During the reconversion period, it seems likely that imported Swiss watches and movements will continue to supply practically the entire domestic demand for jeweled watches, estimated at between 6 and 7 million units annually. Gradually, however, domestic producers of both jeweled and nonjeweled watches will presumably again attain their pre-war level of production and sales. Although the watch industry does not have a backlog of pent-up civilian demand comparable with that of some other industries, it would seem, nevertheless, that during the war years a considerable consumer demand, especially for the well-known, high-grade domestic jeweled watches, has been deferred to the post-war period.

POST-WAR LONG TERM

Consumption, Production, and Imports

Because of the marked difference with respect to the competition of imports with domestic production as between jewel-type watches (of which imports are large) and other watches (of which imports are insignificant), the following estimates distinguish these two classes, and relate principally to the effects of changes in national income and in rates of duty upon the imports and production of the jewel-type watches.

Per capita income at 1939 level.

The number of watches of both types "consumed" (purchased) is likely to be about the same per capita as in 1939, and the average unit value of the watches of each of the two main types substantially the same as in that year. By reason of the increase in population, domestic consumption of jeweled watches might, with the duties as in 1939, amount to about 6.5 million units, and of watches without jewels to about 10 million units. The consumption of jeweled watches, in number, might be affected considerably by a 50-percent change in duty in either direction.

Duty as in 1939.—Imports, as before the war, would consist almost exclusively of jeweled Swiss watch movements to be cased by domestic assemblers. The imports would probably account, as in 1939, for a little less than half the domestic consumption of jeweled watch units (estimated above at 6.5 million), or about 3.2 million units, with an aggregate value of about 9.6 million dollars (the average unit foreign value being about 10 percent higher than in 1939, or \$3 each). The character of imports appears to be changing, 15- and 17-jewel movements accounting for nearly 70 percent of the total in 1943, compared with 51 percent in 1939. Certain improvements have been made which seem likely to be retained. Average unit foreign values were 15 percent higher in 1941 than in 1939, 30 percent higher in 1942, and 50 percent higher in 1943. Production of jeweled watches in the United States (which would be almost exclusively for domestic consumption), would amount to about 3.3 million units, with an estimated value of about 33 million dollars (average unit value about \$10). Imports of watches without jewels would be negligible, and production for domestic consumption would probably amount to about 10 million units, with a total value of about 7 million dollars (at an average unit value of 70 cents, as in 1939). The estimates of quantity and value for this class of watches would also hold for the other two assumptions regarding duties, at the 1939 level of income.

Duty reduced by 50 percent.—A horizontal decrease of 50 percent in all the rates of duty applicable to jeweled watches and watch movements (including the additional duties for extra jewelings, adjustments, and self-winding mechanisms) would probably increase total consumption by about 5 percent, or, say, to 6.8 million units. The reduction in duties would have a major effect on both the total number and the composition of the imports of jeweled movements, and converse effects upon the number and composition of the domestic production.

The duties are relatively more restrictive on the importation of low-priced goods than on that of high-priced goods. A 50-percent reduction in duties would probably make it possible for the Swiss manufacturers to sell much larger numbers of cheap jeweled watches in the United States than heretofore, with the result that the average unit value of imports would be somewhat lower under the reduced duties than with the duties as in 1939. This influence on the average unit value would, however, be partly offset by the probability that the Swiss producers would take advantage of the reduction in the duties to increase somewhat their foreign prices for the higher grade watches. The effects of the reduction of duties on the composition and average unit value of the domestic production would be the converse of the effects on imports. There would probably be a reduction of output in each of the grades of jeweled watches, but the

reduction would be much greater in the cheaper than in the higher priced watches, with the result that the average unit value of all the jeweled watches produced would rise materially, even if, as is probable, the producers should make some reduction in their prices for watches of any given type or grade in order to meet the lower duty-paid prices of imported watch movements.

On the basis of these considerations it is estimated that a 50-percent reduction in the duties on jeweled watch movements might raise the share of consumption (taken as 6.8 million) supplied by imports, in terms of number of watches, to about five-eighths, the number imported becoming, say, 4½ million units (about one-third more than with no change in duties). The average unit value of imports might be about \$2.80 each, or about 7 percent lower than with the duties as in 1939, in which case the total foreign value of imports would be about 11.9 million dollars. Domestic production of jeweled movements would then probably be in the neighborhood of 2,550,000 units, and, since production would be more concentrated on high-priced watches, the average unit value might be about \$12 each (about 20 percent higher than in 1939), giving a total value around 30.6 million dollars.

Duty increased by 50 percent.—A uniform 50-percent increase in all duties applicable to watches and watch movements would give an average ad valorem equivalent rate of over 90 percent. As a result, total imports would decline substantially, and consumption might decrease to about 6.3 million units. The reduction in duties would affect the different grades of movements imported in different ways, but probably the imports of the higher priced movements would decline somewhat less than those of the lower priced, so that the average foreign unit value of the imports might be slightly higher than with no change in duties. Conversely, the average unit value of domestic watches produced would probably be a little lower than with no change in duties.

It is probable that such an increase in duties would reduce the imports of Swiss watch movements, in terms of numbers of units, to about three-eighths of the domestic consumption of jeweled watch movements, or to about 2,350,000 units, with a foreign value about 7.3 million dollars (average foreign unit value estimated at \$3.10). Domestic production of jeweled watches might be about 3,950,000, with a value around 38.4 million dollars.

Per capita income 75 percent higher than in 1939.

The number of watches purchased under such a level of income would be considerably greater than with income as in 1939, but perhaps equally important would be the effect in raising the average grade of watches purchased.

Consumption of watches without jewels, which are less of a luxury, might not be more than 10 percent greater in number than with per capita income as in 1939, but a larger proportion would consist of better grade wrist watches, so that the average unit price would be higher, in addition to the effect of the general upward trend of the price level of commodities. Production of these watches for domestic consumption might be 11 million units, with a value of about 11 million dollars. This figure would probably not be affected by changes of 50 percent in the duties.

Consumption of jeweled watches, in terms of number, might be about 25 percent greater than at the lower income level, amounting (on the assumption of no change in duties) to about 8 million units. The average unit value of both production and imports (on the same assumption regarding duties) might be about 25 percent higher than at the lower income level, partly by reason of a higher proportion of the more expensive watches and partly as the result of an increase of 10 percent or more in the general price level.

The effects of changes in duties on total consumption and on the proportion of the consumption of jeweled watches that would be supplied by imports would probably be substantially the same at the high income level as at the income level of 1939. Moreover, the effects of changes in duty on the composition, and hence on the average unit values, of imports and of production would be parallel to those estimated for the lower income level. On that basis the quantities and values of imports and of domestic production of jeweled watches, under the several assumptions regarding rates of duty, would be approximately as shown in the second section of the following table, which also summarizes the estimates above presented on the assumption of national income as in 1939.

Summary of estimates.

The foregoing estimates regarding jeweled watches are summarized in the table below:

Jeweled watches and watch movements: Post-war consumption, imports, and production under the assumptions of Senate Resolution 341

Period, income level, and tariff treatment	Consumption	Imports				Production		
		Number		Unit value (foreign)	Value (foreign)	Number	Unit value	Value
		Percent of consumption	Units					
1939	Thousands 5,900	49	Thousands 2,900	1,000 dollars 2.76	1,000 dollars 8,100	Thousands 3,000	\$10.10	1,000 dollars 30,300
Post-war long term:								
Income as in 1939:								
Duty as in 1939	6,500	49	3,200	3.00	9,600	3,300	10.00	23,000
Duty reduced by 50 percent	6,800	62½	4,250	2.80	11,900	2,550	12.00	30,600
Duty increased by 50 percent	6,300	37½	2,360	3.10	7,300	3,940	9.75	38,400
Per capita income 75 percent above 1939:								
Duty as in 1939	8,000	49	3,900	3.75	14,500	4,100	13.00	58,300
Duty reduced by 50 percent	8,400	62½	5,250	3.50	17,400	3,150	15.00	47,250
Duty increased by 50 percent	7,700	37½	2,900	4.00	11,600	4,800	12.75	61,200

Exports

Exports of watches are reported under two classifications: Jeweled and nonjeweled. The latter are the more important, amounting in 1939 to nearly 368,000 units, valued at \$301,000 (average unit value

82¢). The exports of jeweled watches numbered a little less than 25,000 and were valued at \$289,000 (average unit value \$11.30).

It is not anticipated that exports of jeweled watches will become important in either of the post-war periods. On the other hand, it is possible that the domestic nonjeweled watches may be exported in substantially larger quantities than before the war, especially if world income should reach a high level. This increase would be all the more likely during the period preceding the return of the German and Japanese industries to full production.

Employment

It is estimated that a total of 8,000 to 10,000 persons were employed in the jeweled and nonjeweled watch industries, including an appropriate proportion of watchcase workers making cases for domestic movements. Increased production owing to larger population and income may augment employment by 10 to 20 percent. With per capita income at 1939 level and with no change in duties, employment in the long-term post-war period might be 10,000 to 11,000, and with the higher per capita income it might be 12,000 to 13,000. It would be difficult to predict with any accuracy the effects of reduced production and increased imports, or of increased production with reduced imports. Some of the workers laid off by manufacturers would find employment with assemblers of imported movements and vice versa.

JEWEL BEARINGS

Tariff paragraph: 367.

Commodity: Jewel bearings for clocks, watches, and instruments.

Rate of duty: 10 percent ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (millions).....	5.0	43.7	48.7	Percent 90
Value (\$1,000).....	1,000	913		
Unit value (per thousand).....	\$200	\$28		

¹ Exports are negligible.

² Estimated.

³ Landed value; foreign value was \$21.

In 1939 there were 10 to 15 lapidary shops in the United States, which may have cut as many as 5 million bearings; these were very largely specialties. Domestic consumption may have been 45 to 50 million bearings. Prices for bearings made in the United States, according to the trade, were \$200 or more per thousand, compared with an average of \$21 a thousand (foreign value) for those imported. Imports were practically all from Switzerland. Domestic production has increased materially during the war, and may now be 15-20 million annually, at unit prices still averaging about \$200 a thousand.

The largest consumer of jewel bearings in the United States is the jeweled-watch industry, which uses from 7 to 23 bearings in each watch, according to its required degree of precision. The highest quality wrist watches made by that branch of the industry which produces mainly watches without jewels (clock-type watches) have jewel bearings, up to 7 in number. A relatively few clocks have these bearings, but it seems unlikely that the consumption for clocks exceeds a half million. There are 2 to 4 jewel bearings in electric, gas, and water meters, and in a number of other types of electrical and mechanical control instruments and apparatus. Likewise they are used in a number of aeronautical instruments, as well as in some of the similar devices used as aid in water navigation.

Estimates made in this report are based on the probable domestic use of these articles for all the foregoing purposes. The quantities for domestic consumption may vary considerably under the different conditions of income and duties because these may affect watch production and consumption; imports will vary more or less correspondingly.

POST-WAR SHORT TERM

The domestic watch industry may not be able to return to peacetime production for 9 to 12 months after the war. Probably immediate post-war domestic consumption and imports of jewel bearings will be substantially less than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

The jeweled-watch industry is likely to be in a position to produce at full peacetime capacity. Demands for all types of navigation instruments may be about at the 1939 level or a little higher. It may be expected that a substantially greater quantity of jewel bearings will be required for use in recording and control instruments and mechanisms. It seems unlikely that the domestic output will be greater than 10 million bearings under any of the assumptions as to income and rates of duty, in view of the great variance in unit values between those produced abroad and those made in the United States. As the production of jeweled watches in the United States is likely to vary considerably under the different conditions of income and duties, consumption of jewel bearings will change correspondingly.

Per capita income at 1939 level.

Duty as in 1939.—Domestic consumption may be about 50 million bearings. Imports may account for about 84 percent of the consumption, or 42 million units, valued at a little over 1 million dollars (\$25 a thousand, foreign value). Production then would be about 8 million units with a value of \$960,000 (\$120 a thousand units).

Duty reduced by 50 percent.—With a corresponding reduction in duties on watch imports resulting in substantially less domestic production of watches, consumption of jewel bearings would be reduced and might be about 40 million units. Imports might amount to 82 percent of consumption, or 33 million units, valued at about \$830,000 (\$25 per thousand, foreign value). Production might be 7 million units valued at \$840,000 (about \$120 per thousand).

Duty increased by 50 percent.—Domestic jeweled watch production might be greater under this change in duty rates, and consumption of jewel bearings reach 59 million units. Imports might be 86 percent of consumption, or 50.5 million units, with a foreign value of about \$1,250,000 (\$25 per thousand, foreign value). Production then would be 8.5 million units with value of about 1 million dollars (\$120 per 1,000 units).

Per capita income 75 percent higher than in 1939

With higher income, more watches, instruments, and other devices in which jeweled bearings are used might be produced. Probably domestic watches will have higher jewelery. Prices of domestic and foreign jewels (foreign value) might be 10–15 percent higher than at the lower income level.

Duty as in 1939.—Domestic consumption might be about 72 million units, or about 40 percent more than with income as in 1939. Imports might amount to about 87 percent of consumption, or 62.5 million units, with a foreign value of 1.7 million dollars (about \$28 per thousand). Production then would be 9.5 million units with a value of nearly 1.3 million dollars (\$135 per thousand units).

Duty reduced 50 percent.—Domestic consumption might amount to only 67 million units. Imports might be about 85 percent of this total, or 58 million units, with a foreign value of nearly 1.6 million dollars (\$28 per thousand). Production would be about 8.0 million units, with a value of nearly 1.1 million dollars (\$135 per thousand units).

Duty increased by 50 percent.—Domestic consumption might be about 85 million units. Imports might be about 89 percent of consumption, or 75.5 million units, with a foreign value of a little over 2.3 million dollars (\$28 per thousand). Production then would be about 9.5 million units, with a value of nearly 1.3 million dollars (\$135 per thousand units).

Exports

United States exports of bearings have been negligible, and there appears to be little reason to expect them to be otherwise in the post-war period.

Employment

No data are available regarding employment. It may be assumed that the number has increased appreciably in war years. Manufacturers already have in production commodities, such as very small precision plug and ring gages, which may provide employment for this personnel.

MOTOR VEHICLES (AND PARTS)

Tariff paragraph: 369.

Commodity: Motor vehicles (and parts).

Rate of duty: Passenger cars, 10 percent; parts, trucks, and busses, 25 percent.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Complete vehicles, new:						Percent
Quantity (thousands).....	3,525	1,263	2,272	0.3	2,272	0.01
Value (\$1,000).....	2,275,254	1,154,164	2,121,091	378		
Unit value.....	\$646	\$910	\$948	\$1,264		
Vehicles and parts: Value (\$1,000).....	2,776,405	283,722	3,522,683	1,446		
Persons employed (number).....	400,000					

¹ In addition to exports of complete vehicles, parts were exported for foreign assembly to the value of 49 million dollars.

² In addition to 299 new vehicles represented by this figure, 335 used vehicles were imported, principally of United States make.

³ Foreign value.

⁴ Includes considerable duplication, as many parts are sold for assembly and resale in the completed vehicle.

The trend of production and imports and exports in recent years is shown below:

New motor vehicles: ¹ United States production, imports, and exports, 1936-41

Year	Factory sales	Production	Imports complete vehicles	Exports			
				Complete vehicles		Parts for assembly	Total value ²
				Quantity	Value		
	<i>1,000</i>	<i>\$1,000</i>	<i>1,000</i>	<i>1,000</i>	<i>\$1,000</i>	<i>1,000</i>	<i>\$1,000</i>
1936.....	4,454	(³)	0.461	286	157,797	46,826	240,213
1937.....	4,809	\$2,848,786	1.442	395	234,968	62,266	346,867
1938.....	2,490	(³)	.188	277	172,298	52,351	370,427
1939.....	3,577	\$2,275,254	.299	253	154,164	49,291	253,722
1940.....	4,469	(³)	.561	193	145,456	58,831	244,322
1941.....	4,839	(³)	.053	229	209,038	71,786	330,681
Average, 1936-41.....	4,140						

¹ Usually about 20 percent of vehicles produced are commercial cars and trucks.

² Includes parts for replacement.

³ Not available.

⁴ Does not include parts for replacement or parts for export.

The motor-vehicle industry is among the first in value of production in the United States. There are about 10 manufacturers of passenger cars and twice as many of trucks. Three firms produce about 90 percent of the passenger cars and many of the trucks. A very large industry has grown up, composed of many firms supplying parts to the automobile builders. Important parts such as frames, wheels, carburetors, and radiators are supplied chiefly by specialty makers. The census reported 1,054 firms in the entire industry in 1939.

The large population and high income of the United States has afforded the motor-vehicle manufacturer a unique market. He has taken advantage of this by installing a vast amount of mass production manufacturing equipment, the heavy investment in which is repaid by the low unit cost at which cars and trucks can be sold, and the resulting great volume of sales.

As a consequence, American motor vehicles are exported in large numbers to every country in the world. Imports into the United States have been negligible in relation to the domestic output. In recent years they have consisted mainly of three classes: (a) A few

very high-priced cars, mostly from Great Britain; (b) several hundred very small, low-priced cars, chiefly from Italy and Great Britain, the total value of which approximates that of the few high-priced cars; and (c) parts for trucks, made by a German affiliate of an American car and truck builder, imported for assembly in the United States and for reexport, which constituted two-thirds of the total imports. German control of exchange was doubtless the principal cause of this practice.

Production of passenger cars was stopped in the early part of 1942, and all manufacturing facilities converted to war purposes. Production of trucks continued on about the same scale as before, but only a small part of those made were allotted to civilian use.

There were about 34 million cars in the United States at the close of 1941. Since then the number in use has been declining by about 2 million yearly, compared with an annual pre-war increase of about $1\frac{1}{4}$ million.

POST-WAR SHORT TERM

In the immediate post-war period, production of automobiles, because of the huge deferred demand, will be at a peak, and production may approach 6 million units in addition to production of parts. Allowing for a 10- to 20-percent increase in prices and an increased proportion of higher-priced cars, resulting from anticipated high national income, production, including parts for export, might have a value of 5-6 billion dollars. Imports will probably be at a minimum.

POST-WAR LONG TERM

In the long run, United States consumption of automobiles will depend largely on national income. The American people as a whole probably place automobiles next to food and clothing in their spending. Changes of 50 percent in the present duty will have negligible effect on consumption and only slight effect on imports. These factors are taken into consideration in making the estimates which follow.

Per capita income at 1939 level.

Assuming that the accumulated demand for cars and trucks has been satisfied, the long-run demand at 1939 income levels, taking into account increase in population, would be perhaps 4.5-5.0 million cars annually, with a value (including parts but exclusive of duplication) at 1939 prices, of $3\frac{1}{2}$ -4 billion dollars. The production of $3\frac{1}{2}$ million cars in 1939 was well below the pre-war average and below its usual relation to the national income. Imports fluctuated greatly in the pre-war years. In the long run they might be 0.5-1.5 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of cars and trucks under a greatly increased income might total 6-7 million which, at increased price levels and with a probable tendency toward the use of higher grade cars, would probably have a value of 5.5-6.5 billion dollars, including parts (without duplication). There might be somewhat larger purchases of high-priced foreign cars, with imports ranging from 1-2 million dollars.

Exports

With the natural or fostered growth of the automotive industry abroad, the United States has supplied a decreasing share of the foreign market. In 1929 about half of all motor vehicles registered in foreign

countries were American cars; in 1939, only 38 percent. The value of exports declined drastically after 1929, when they reached a peak of 500 million dollars. With world income at 1939 levels, exports might total 300-350 million dollars annually. With larger world income and with less pressure for the control of international trade and the support of home industries, the superior position of the United States industry would probably enable it to recapture, at least in part, its former position. Under these conditions exports might be about 400-600 million dollars annually.

Employment

In 1939 there were slightly under 400,000 wage earners reported for the industry, including the production of parts. There is a gradual trend toward still more efficient methods of production, but far-reaching changes are not probable in the near future. Under the most favorable conditions as to volume of production, employment in the long-term post-war period might reach 600,000.

PLEASURE BOATS

Tariff paragraph: 370.

Commodity: Motorboats, yachts, sailboats, and motor-propelled canoes and rowboats.

Rate of duty: Valued not more than \$15,000 each, 15%; valued over \$15,000 each, 30%. *Equivalent ad valorem (1939):* 17%.

Note.—The rate fixed in the Tariff Act of 1930 was 30% ad valorem, regardless of value. The reduced rate of 15% on boats valued at not more than \$15,000 each became effective January 1, 1939, pursuant to the trade agreement with Canada.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	\$ 6,400	\$ 1,190	5,210	\$ 137	5,847	<i>Percent</i> 2.5
Persons employed (number).....	3,000					

¹ Excludes commercial or naval craft.

² Approximate.

³ Exports represent motorboats with engines installed, irrespective of use.

⁴ Foreign value.

⁵ Estimated; seasonal maximum.

The United States has a large fleet of recreational craft including over 300,000 numbered motorboats and documented yachts, all but a small percentage of which were built in the United States. The domestic industry produces pleasure craft of all kinds. In value of output, inboard motorboats and sailboats predominate; numerically,

rowboats, outboard motorboats, and canoes are the most important group.

The domestic industry occupies a strong competitive position. In the past, a limited number of pleasure craft have been imported annually from Canada, Norway, Sweden, and the United Kingdom, and a very few expensive motor yachts have been imported occasionally from Germany. On a value basis, Germany has been the chief supplier.

During the war there has been limited activity in the pleasure-craft trade. Many motorboats formerly used for pleasure have been acquired by the Government for official purposes. Domestic production of boats has been limited to war requirements; and imports and exports of pleasure craft have been negligible.

Sales of pleasure boats rise with increased national income. The lowering of prices of these boats, together with the greater use of automobiles, which has enabled more people to take advantage of water sports, has helped to widen the market.

POST-WAR SHORT TERM

After the war there will probably be increased interest in boating, and the demand for pleasure boats will be great. Part of the demand, however, will be satisfied by the sale of surplus boats which were built for (or converted to) military purposes but can readily be converted to pleasure use.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Annual consumption of pleasure boats in the post-war period may have a value of 6 million dollars, or only slightly greater than in 1939. Changes in duty are not likely to have much effect on consumption.

Duty as in 1939.—Total imports in 1939 were valued at approximately the same as in 1938 in spite of a 50-percent reduction in duty, effective January 1, 1939, on boats valued at not more than \$15,000 each, although a considerably increased number entered from Canada in 1939. It is not believed that the post-war import trade under duties now existing would be much increased over 1939, or to about \$150,000.

Duty reduced by 50 percent.—There probably would be a considerable increase in the value of boats imported, principally from Canada. The foreign value of imports might be about \$250,000, or about twice what it was in 1939.

Duty increased by 50 percent.—This change would leave the duty on boats valued at less than \$15,000 one-fourth lower than the rate before 1939; an increase in the duty on the higher valued boats would not be particularly effective since relatively few of them have been imported in the past. Imports under these conditions might be half or two-thirds of what they were in 1939, or about \$70,000–\$90,000 (foreign value).

Per capita income 75 percent higher than in 1939.

The value of consumption of pleasure boats would probably be around 65–75 percent higher than with no change in national income, and might have a foreign value of about 10 million dollars.

Duty as in 1939.—Imports would probably share in the increased market in about the same degree as before the war and might be valued at \$250,000 (foreign value).

Duty reduced by 50 percent.—Imports might supply a decidedly higher proportion of consumption than with an unchanged duty, and would perhaps be valued at \$500,000 (foreign value).

Duty increased by 50 percent.—Imports would probably have a foreign value of about \$150,000.

Exports

In the past the export trade has been limited somewhat by restrictive measures operative in many foreign countries because of the desire to maintain boatbuilding as a home industry. However, for certain types of boats, such as speed and racing boats and small pleasure craft, there is a considerable foreign market. Exports in almost all pre-war years were greatly in excess of imports. In the period 1936-1939, exports averaged more than 1 million dollars annually. With an increase in world income levels and some lessening of import restrictions in foreign countries, the average exports of pleasure boats might increase to 2 million dollars annually.

Employment

Since boatbuilding is seasonal, it is difficult to estimate the number of people employed in producing pleasure craft. It may approximate 3,000 persons in the season of maximum employment. Under higher income levels, employment might increase to 5,000, the increase being restricted because of greater standardization of models and the substantial use of new kinds of material.

MACHINERY AND VEHICLES OTHER THAN AUTOMOTIVE OR ELECTRICAL¹

Tariff paragraphs: 321, 337, 371, 372, 397, 412, 1543, 1604, 1643, and 1791.

Commodity: Machinery and vehicles (other than automotive or electrical) and parts and accessories.

Rates of duty: Some articles are free of duty; rates on others range up to an ad valorem equivalent of 54 percent.

Equivalent ad valorem (1939): All items, 20%; dutiable items only, 28%.

NOTE.—In various trade agreements with Sweden, effective August 5, 1935, Switzerland, effective February 15, 1936, Finland, effective November 2, 1936, United Kingdom and Canada, effective January 1, 1939, the rates of duty on certain classes of machines were reduced. These affected about 52 of the 148 classes included in this report. Reduction varied from 2½ to 20 percent ad valorem, or from 9 to 50 percent of the rates as established in the Tariff Act of 1930.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

¹ Does not include aircraft, boats, or ships, refrigeration or air-conditioning or domestic laundry equipment. These are considered in other reports in this series.

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Total value (\$1,000).....	2,921,742	404,420	2,517,322	113,545	2,530,867	Percent 0.54
Persons employed (number).....	520,998					

¹ Landed value; includes an estimated 30 percent for duty and costs of landing; foreign value was \$11,421,000.

The principal items of machinery and vehicles (other than electrical or automotive) which were imported in amounts of \$100,000 foreign value or more in 1939 are shown in the following table, together with the values of their production, exports, and imports in 1939. All those classes of machinery included in this report which were imported in amounts less than \$100,000 each are shown in the table as "all other."

Of the total foreign value of imports in 1939, about 31 percent, consisting mostly of agricultural machinery and implements, were admitted free of duty. About 40 percent were dutiable at rates in a range of 21 to 30 percent ad valorem, 4 percent dutiable at over 40 percent, and the rest were divided between the duty ranges of 0 to 20 percent and 31 to 40 percent duty.

The relatively small United States imports have consisted of a few patented machines, some specialties not in sufficient demand here to be attractive to United States producers, and types of equipment, such as certain textile machines, which are competitive with domestic production. A substantial proportion of imports has consisted of parts for machines previously imported. The difficulty often incurred in obtaining repair parts for foreign-made machines acts as a deterrent to imports.

Many manufacturing and mining industries in foreign countries, especially those operating on a mass-production basis, have long depended upon the United States for certain equipment. This condition is unlikely to change greatly for a considerable period, as industrialization is a slow process and much time is required to develop production of mechanical equipment.

Although most of the United States factories have been producing at unprecedented levels during the war, the amount of machinery and vehicles available for other than war use has been very limited.

Brief statements regarding the production of and trade in each of the principal classes of machinery covered in this report follow:

Machine tools and metalworking machinery.

The value of the output of machines for cutting and forming metal, such as lathes, millers, planers, grinders, presses, forges, and rolling-mill machinery, ranged from 74 million dollars to over 400 million dollars in the census years 1925 to 1939. Exports of 117 million dollars in 1939 were over one-fourth the value of production in that year.

Machinery and vehicles other than automotive or electric: Production, exports, imports, and duty by classes, 1939

Class	Production		Exports		Imports		Equivalent ad valorem duty
	Value	Percent of total	Value	Percent of total	Foreign value	Percent of total	
Machine tools and metalworking machinery.....	1,000 dollars 416,800	14.3	1,000 dollars 116,670	28.8	1,000 dollars 663	6.1	Percent 20
Agricultural machinery, tractors, and cream separators.....	367,654	12.6	67,100	16.6	3,069	28.3	Free
Printing machinery.....	50,456	1.7	8,895	2.2	226	2.1	25
Shoe machinery.....	10,603	.4	895	.2	453	4.1	Free
Tobacco machinery.....	3,337	.1	488	.1	268	2.6	24
Wrapping and packaging machinery.....	18,270	.6	(?)	-----	360	3.4	25
Pulp- and paper-mill machinery.....	23,816	.8	795	.2	146	1.3	21
Steam turbines.....	30,969	1.1	1,518	.4	101	.9	20
Diesel engines.....	45,528	1.5	2,452	.6	372	3.4	22
Textile machinery, including sewing machines.....	113,447	3.9	18,195	4.5	2,928	26.8	31
Bicycles ⁴	22,467	.8	297	.1	277	2.5	21.5
All other.....	1,818,395	62.2	187,115	46.3	2,002	18.5	-----
Total.....	2,921,743	100.0	404,420	100.0	10,914	100.0	-----

¹ The census report on the manufacture and sale of farm-equipment and related products includes \$48,250,000 of miscellaneous equipment such as barn and barnyard and poultry equipment in addition to the amount shown here.

² Not separately reported in export statistics.

³ In addition, \$672,194 worth of marine Diesel engines were exported.

⁴ The value of complete bicycles only was reported in the production statistics of the United States Bureau of the Census.

Imports, which supplied from 0.18 to 0.27 percent of domestic consumption (purchases) between 1931 and 1939, are dutiable at 15, 30, or 40 percent ad valorem. They consisted in part of general-purpose machines which are fully competitive with similar types made in the United States, and in part of specialties, such as high-precision jig borers and watchmaking equipment. The usual sources of imports were Germany, which supplied about 50 percent of the total in 1939, Sweden, Switzerland, and the United Kingdom.

In spite of the large amount of machine tools produced during the war, production in the early post-war years, particularly of special-purpose machines, may be at about the 1939 level, which was 60 percent above the average for census years from 1927 to 1939. Domestic industry will need retooling for a high production of civilian goods, as well as for some expansion of exports to replace wartime destruction and to contribute to the increasing industrialization of other countries. Foreign production may be at a low level for some time. Imports in the immediate post-war period are likely to be much less than before the war.

Because of the possible surplus of general-purpose machine tools for some years after the war, and the fact that production in 1939 was somewhat above the pre-war annual average, production and trade might be about the same in the long-term post-war period as in 1939, assuming no increase in per capita income. With a 75-percent increase in income, however, production of these machines would increase markedly, since they are indispensable to practically all manufacturing processes. Although 50 percent changes in duty may increase or decrease imports of metal-working machinery, such variations could have only insignificant effect on domestic consumption and production, the ratio of imports to consumption being very low.

Agricultural machinery.

Imports of agricultural machinery, which are free of duty, amounted in value to 3.0 million dollars in 1939; domestic production, second in the machinery group only to machine tools and metalworking machinery, amounted to 368 million dollars. Much of our imports of agricultural machinery is probably composed of interplant exchanges by companies which produce in both the United States and Canada. Canada supplies most of the United States imports except cream separators valued at not more than \$50, which are mostly from Sweden. The separators are imported in much higher ratio to consumption (28 percent in 1939) than agricultural machinery as a whole (1.15 percent in 1939). Tractor imports are usually not over 1 percent of domestic consumption; they were only 0.2 percent in 1939.

United States exports of agricultural machinery in 1939 were over 21 times the imports in value.

Probably 80 percent or more of the United States output of agricultural machinery is produced by a relatively few large companies, eight of which are full-line producers. Annual production in the United States has increased since 1939 by an average of about 44 percent. Exports and imports have also increased during the war. Production of and trade in agricultural machinery, in both the early post-war years and in the long term at the higher-income level, might be much larger than in 1939. Even without an increase in per capita income in the long-term period, a slightly higher level of general purchases of agricultural machinery might materialize than could be ascribed to population growth alone, because of increased mechanization of small farms.

Printing machinery.

Imports of printing machinery are subject to a duty of 25 percent ad valorem. In 1939 Germany supplied about 77 percent of United States imports, the total of which was only \$226,000, or 0.54 percent of United States consumption. Imports consisted mostly of the German-made "Heidelberger", a small high-speed platen press widely used in small job shops. German presses for two-color printing and for printing on metals and glass were also in some demand. Early post-war imports may be even smaller than before the war, and probably in the longer term will constitute no larger proportion of consumption than in 1939. Exports of printing machinery (\$8,895,000 in 1939) have always been a substantial part of production. They might be considerably higher in both the short- and long-term periods at the higher levels of income. Although a little over 50 percent of exports in 1939 went to five countries—Canada, the United Kingdom, Argentina, Sweden, and Australia, the total market consisted of 94 countries.

Changes of 50 percent in the rate of duty would probably affect the volume of imports to only a limited degree, because of the specialized nature of imports. Such variations could have only insignificant effect on domestic consumption or production.

Shoe machinery.

The production of shoe machinery in the United States, which was valued at 10.6 million dollars in 1939, is dominated by one large corporation, which before the war maintained subsidiaries in Germany, France, England, and Canada. The product of this corporation was

distributed for use only on a lease basis. The many smaller companies producing shoe machinery offer a fairly competitive line for outright sale. Imports of shoe machinery, which are free of duty, were only about one-half the exports in 1939, in value. The servicing of machines leased by the dominant United States manufacturer, and the difficulty of obtaining repair parts and service on foreign-made machines, are factors tending to restrict imports of shoe machinery. Exports declined from 17 percent of production in 1919 to about 6.5 percent in 1935; they were 8.5 percent in 1939. Increased sales of shoes would doubtless result from an increase in per capita national income, and thus stimulate the long-run production of shoe machinery.

Tobacco machinery.

Tobacco machinery includes cigar- and cigarette-making, and leaf processing and cutting machines, and other machines used in making tobacco products. Although there are many foreign-made machines in use in the United States, pre-war imports consisted mostly of repair parts of special machines or attachments not built in this country because of patent rights and the small number in demand. Recent improvements in tobacco machinery of United States manufacture indicate the probability of small imports in the post-war period. Production and trade have been erratic. In 1939 more than 75 percent of United States imports, on which the duty ranged from 22½ to 27½ percent, were from the United Kingdom; Sweden, Canada, and Germany supplied the remainder. Wartime restrictions on production and the intensive use of existing machinery may result in greater demand, lower imports, and somewhat larger exports for 2 or 3 years after the war than in 1939. In the long-term period, at the 1939 income level, domestic purchases of tobacco machinery might increase slightly over 1939. Changes in duty might affect imports, and consequently United States production, of tobacco machinery much more than in the case of most other lines of machinery, because of a ratio of imports to consumption (9 percent in 1939) much higher than for most machinery items. At the higher income level, purchases of tobacco machinery might increase considerably above those in 1939. With no change in duty, imports at the 1939 ratio to consumption might be about average or somewhat higher than in 1939. Production might also be somewhat higher. At the lower rate of duty imports might increase considerably, with a corresponding reduction in domestic production. With increased duty, imports might be much lower and production equally higher.

Wrapping and packaging machinery.

The import duties on wrapping and packaging machinery are 17½, 27½, or 35 percent ad valorem. In 1939 the duties on imports averaged 25 percent.

This machinery consists of four major groups, known to the trade as packaging, loose-wrapping, bottle-filling, and shipping-container inserting and sealing machinery. The types range from fully automatic to simple manual units.

Imports in 1939 were only 2 percent of domestic purchases. They consisted mostly of candy and cigarette wrapping and packaging machines from the United Kingdom and razor-blade-wrapping machines from Germany. These machines were specialties of the two countries of origin.

As a result of new uses for classes of machinery developed during the war, production may be considerably greater after the war than before. In the long-term post-war period, even with national income at only about the 1939 level, demand and production may be about 25 percent higher than in 1939. Exports also will probably expand, but imports, particularly those of a specialized nature, will probably not be much larger than in 1939 unless duties are reduced. A substantial increase in national income would perhaps result in an increase in production of as much as 75 percent over the 1939 level. Exports might be expected to increase by a somewhat less percentage, and imports in only moderate degree. Imports of a general nature would respond to 50-percent changes in duty, but these changes would have much less effect on imports of those machines which might be classed as specialties.

Machines for making paper pulp and paper.²

Consumption (i. e., sales) of this kind of machinery follows the trend of industrial activity generally, and is particularly responsive to the prospective demand for paper and paper products.

The United States was on an export basis before the war, exports being equivalent to about 3 or 4 percent of domestic production and imports to less than 1 percent. Imports, consisting mostly of machines embodying special patented features, have come principally from Sweden, the United Kingdom, and Germany. The rate of duty was reduced from 27½ to 20 percent ad valorem in the trade agreement with Sweden, effective August 5, 1935.

Demand and production may be fairly high immediately after the war, to replace worn equipment and to supply an accumulated export demand. Imports will probably be smaller than before the war because of industrial disorganization in Germany and the necessity of using industrial equipment for more pressing needs in the other countries which have been sources of United States imports.

In the longer post-war period, it is unlikely that changes in duty will have important effects on imports. Because of the specialized nature of imported machines, it is probable that they will continue to meet the needs of only a small part of the United States market.

With no increase in the per capita national income over 1939, domestic production may rise roughly in proportion to the increase in population. Exports and imports would probably increase similarly.

With average per capita income 75 percent larger than in 1939, it is estimated that consumption of paper and paper products may register an increase of around 60 percent over 1939 figures.³ The demand for machinery to provide for this consumption and for an increased export trade would probably raise machinery production to an annual value possibly double that in 1939. Imports might increase proportionately.

Steam turbines.

The principal uses for steam turbines are for driving electric generators and propelling ships, but there are also many uses for smaller sizes. Turbines range from small machines for lighting mounted on steam locomotives to power-station units valued at more than 1 million dollars each. The volume of production depends mainly on expansion

² See sections on pulpwood, wood pulp, and paper in this series.

³ *Idem.*

of electric power service and on shipbuilding. In 1939 domestic production of turbines amounted in value to about 31 million dollars.

Large turbines are usually built, as units with electric generators, by electrical manufacturing firms, which generally furnish much of the accompanying equipment. Domestic producers have an advantage over foreign competitors, both in the usual preliminary technical collaboration between builder and buyer, and later in their ability to supply suitable equipment for plant extensions.

The largest domestic producer and some of the principal foreign electrical firms were parties before the war to an extensive series of agreements dealing with electrical equipment and steam turbines. The Department of Justice alleges in a pending complaint that these agreements provided that the foreign parties would not sell in the United States and that the American company would not sell in the home countries of the other participants.

Imports have been largely of special designs, some of which domestic builders did not find it worth while to make. There has been a rather steady importation of parts for turbines previously imported. In 1939 total imports of this class of machinery amounted to about \$100,000, foreign value, of which 40 percent consisted of parts. Because of the high unit value of some turbines and the special nature of the demand, imports are likely to vary considerably from year to year and not to be greatly affected by duty changes. The present rate of duty is 20 percent ad valorem.

Diesel engines.

Diesel engines, using fuel which is heavier and cheaper than gasoline, are efficient sources of power for small and moderate-sized ships and power stations, as well as for motor vehicles, for farm engines and tractors, and for many other purposes. As they are producers' and consumers' capital goods, consumption is likely to vary closely with industrial activity and national income.

In 1939 the value of domestic production was about 44 million dollars, of exports about 3 million, of imports about \$372,000 (foreign value). In the long-term post-war period, with national income at the 1939 level, consumption might be somewhat above that of 1939; with national income 75 percent above that of 1939 it might increase to about 100 million dollars annually. Technological developments might also increase demand.

Imports have been mostly of high-grade, slow-speed engines, of a few horsepower each, and parts for engines imported in earlier years. Engines of these small sizes are also made in small numbers in the United States, but not by the larger firms. Since imports depend largely on preference for certain foreign designs, duty changes of 50 percent probably would affect imports only moderately. It seems unlikely that they would become very large under a reduced duty, as substantial demand for any type previously imported probably would result in further development and large-scale production of that type by established domestic builders.

The present rates of duty range from 17½ to 27½ percent ad valorem, the average in 1939 being about 22 percent.

Textile machinery.

Textile machinery is dutiable at rates ranging from 15 to 40 percent ad valorem. The class includes sewing machines, and spinning,

weaving, and other equipment for producing yarn and fabric. The United States is the world's largest consumer and one of the two largest producers. Domestic production usually exceeds 100 million dollars in value, of which about 15 percent is exported. Imports, principally from the United Kingdom, Germany, France, and Switzerland, usually supply less than 5 percent of domestic consumption.

The domestic textile-machinery industry is composed of a number of distinct branches. Although the ratio of total imports to total production is low, certain branches meet strong competition from imports. The competitive types, consisting principally of full-fashioned hosiery machines, equipment for producing worsted yarn by the Bradford system, and card clothing, represent over 50 percent of all textile machinery imported. Any changes in duty on these competitive types would have a direct bearing on imports and therefore on domestic production. The group of producers who meet comparatively little competition from abroad include the manufacturers of cotton- and woolen-yarn machinery, winders, looms, circular knitting machines, finishing machines, and sewing machines. There is also some importation of textile machines of types not produced in the United States. This group includes lace and embroidery machines.

During the first few years after the war, and also in the post-war long term if income should be at a high level, production and consumption in the United States will probably be substantially greater than in 1939. In the long term, however, with income at the 1939 level, consumption might be only slightly higher than in 1939. Under the 1939 rates of duty, the ratio of imports to consumption might be about the same as in years before the war; but, with a 50 percent increase or decrease in rates of duty, imports of the competitive types would probably change considerably.

In the short term, exports might be greater and imports smaller than in 1939, as the United States producers will doubtless be able to recon-vert to peacetime production in a shorter period than many of the foreign producers. Furthermore, when foreign manufacturers are again in operation, they will probably not be able to regain their former position in foreign trade immediately, as the larger part of their output is likely to be required to rehabilitate the textile industries in their own countries. By the long-term period foreign producers will probably have regained their pre-war position in foreign markets, and the ratio of United States exports to domestic production might be about the same as before the war.

Bicycles.

Bicycles and frames are dutiable at specific rates, with a minimum of 15 and a maximum of 30 percent ad valorem. Parts are dutiable at 30 percent.

Domestic consumption varies with the popularity of riding. A vogue lasted for a few years about 1900; another began about 1936. In the earlier period, consumption reached 1.2 million bicycles annually; in 1940 it reached 1.8 million. Between these periods it averaged about 350,000, sometimes varying inversely with national income. Consumption in 1939 was about 1.3 million, valued at about 22.5 million dollars.

Japan and the industrial countries of Europe are large producers, some exceeding the United States in volume of production. In most foreign countries the bicycle is a staple means of adult transportation,

and a light-weight type is favored; in the United States probably 95 percent of the output is of heavy types. The light type has recently been finding some favor in the United States.

Imports of complete bicycles have been of the light types, and have come mainly from Great Britain and Germany. In 1939 a third of the imports, mostly of parts, came from Japan.

Future consumption is not likely to fall below the long-term level of about 350,000 bicycles, but the advent or duration of periods of peak consumption cannot be predicted. Consumption might reach 2 million or more annually.

Imports will depend on the popularity of bicycle riding, on the degree to which the light-weight foreign type of bicycle finds favor in the United States, on the extent to which domestic producers turn to the manufacture of this type, and on duty changes.

Other machinery and vehicles (not including automotive and electric).

The specific groups described in the preceding paragraphs accounted in 1939 for nearly four-fifths of the imports but for less than two-fifths of the domestic production of machinery and vehicles (other than automotive and electric). The group of "all other," shown in the above table, consists chiefly of various kinds of power-generating machinery, construction and conveying machinery, mining, well and pumping machinery, office appliances, and numerous kinds of industrial machinery. A large part of the machines in this miscellaneous group is manufactured in the United States by mass-production methods. Moreover, many of the machines are peculiarly adapted to the methods of industry practiced in the United States. Competition of imports is therefore very limited. For the "all other" group as a whole, the foreign value of imports in 1939 was equal to only about one-eighth of 1 percent of the domestic production, and to about 1.1 percent of the exports.

POST-WAR SHORT TERM

Demand for new machinery and vehicles may bring production well above 1939 levels in the first 2 or 3 post-war years. The basis for such a large production would be normal consumption under high-income conditions, an additional amount to meet deferred demand, increased population, and a greater volume of exports.

Assuming that Germany and Japan will be unable to export machinery in large volume, the United States may purchase more from other foreign sources than it did before the war. It is not likely, however, that the ratio of imports to consumption will exceed the 1939 rate of 0.54 percent; it may be considerably lower.

POST-WAR LONG TERM

Consumption, Production, and Imports

Population growth, the spread of mechanical training and experience among our younger men during their war service, new developments in commodities and in methods of production, new machines likely to be devised after the end of the war, and increased industrialization in many foreign countries' (calling for increased exports of machinery from this country) will influence the consumption and production of machinery and vehicles.

In the United States, methods of mass production, and continued research and development in the field of machinery, have kept imports

to a minimum, and limited them chiefly to special machines not required in large numbers in this country. The United States is in a strong export position with respect to machinery in general, and changes of 50 percent in the rates of duty on imports are likely to have little effect on consumption or production (for the domestic market) of machinery in the United States, and to have only a moderate effect on imports.

Per capita income at 1939 level.

Duties as in 1939.—Under these conditions, population growth, industrial advancement, and industrial expansion in many parts of the world may increase the United States production and export trade in machinery and vehicles. Consumption (purchases) may be about 18 percent above 1939, or, say, 3 billion dollars. Production for domestic consumption would be only slightly less. Imports may increase in about the same ratio, and amount to about 13 million dollars foreign value; exports may increase still more, to perhaps 545 million dollars.

Duties reduced by 50 percent.—Imports might be twice as great as with unchanged duties, amounting to about 26 million dollars foreign value, which would not appreciably affect the estimate of production for domestic consumption under the preceding condition.

Duties increased by 50 percent.—Imports might be only about half as great as with 1939 rates of duty, amounting to perhaps 7 million dollars foreign value. Increases (as well as decreases) in duty would probably be more sharply reflected in the importations of tobacco machinery than in most other lines.

Per capita income 75 percent higher than in 1939.

The machinery discussed in this report is of so great a variety and volume and is indispensable to so many industries that the value of production, taking into account some advance in prices, might be expected to increase by about the full percentage increase in national income. An increase in real national income for any extensive period would be impossible without an increase in the production of machinery. The following estimates are based on this consideration and on the further consideration that the trend for many years has been toward increased mechanization in industry.

Duties as in 1939.—Consumption (purchases) of machinery and vehicles, therefore, might be 75 to 80 percent greater than at the lower income level, and amount to about 5.6 billion dollars, the increase being due partly to higher prices. Production might reach 6.7 billion dollars. This estimate allows for increases in exports to about 1.1 billion dollars, and imports of approximately 26 million dollars foreign value, which is in about the same ratio to consumption as in 1939. Production for the domestic market would be nearly equal to total consumption.

Duties reduced by 50 percent.—Imports might be doubled as compared with the amount above estimated, and might amount to about 52 million dollars foreign value, with a consequent reduction in production for domestic consumption; the latter would still, however, remain nearly as large as estimated under the preceding condition, or about 5.6 billion dollars.

Duty increased by 50 percent.—Imports might be 50 percent less than with unchanged duties, and amount to about 13 million dollars foreign value. Some machines manufactured abroad under patent, or foreign-made machines of special design, would doubtless continue

to be imported. Parts for foreign-made machines already in operation in this country would also be imported almost regardless of tariff considerations.

Exports

Exports of machinery and vehicles ranged from 10 to 15 percent of production in the years 1929-39. For the post-war, short-term period, and for the long-term period at the assumed higher level of world income, exports may amount to about 1.1 billion dollars, or about 20 percent of estimated production.

As Germany and Japan may for many years be able to export machinery only in quantities much smaller than before the war, the United States will probably share largely in supplying the needs of their pre-war customers. Because a number of countries in Latin America and Asia may become more industrialized, the United States may be called on to furnish larger quantities of machinery and vehicles than before the war, even if world income should not increase.

Employment

In 1939, with a production of over 3 billion dollars' worth of machinery and vehicles (other than motor vehicles), these industries employed, according to the Census of Manufactures, 520,998 wage earners. Improved methods and machines increased the output per worker during pre-war years, and new developments indicate a continuance of this trend. The number of workers will, therefore, probably increase at a slower rate than the value of production. Employment may perhaps be about 610,000 at the 1939 income level, and up to about 1.1 million persons at the higher income level.

ALUMINUM

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
374-----	Crude aluminum metal and alloys and aluminum scrap:		
	Crude metal and alloys-----	3¢ per lb-----	20%
	Scrap-----	3¢ per lb-----	40%

NOTE.—Duty on crude metal and alloys and scrap reduced from 4 cents to 3 cents per pound by trade agreement with Canada, effective January 1, 1939. Effective March 14, 1942, aluminum scrap was made duty-free for the period of the emergency by Act of Congress.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production					Imports ¹	Apparent consumption	Ratio of imports to consumption
	Total	Secondary	Primary	For export	For domestic market			
Quantity (1,000 short tons)-----	218	54	164	25	193	10	203	Percent
Value (\$1,000)-----	85,909	21,300	64,600	11,386	74,523	2,456		5
Unit value:								
Per ton-----	\$394	\$394	\$394	\$455	\$386	\$236		
Per pound-----	19.7			22.8	19.8	11.8		

¹ Less reexports of ingot and alloys under benefit of draw-back of 3,894 tons.

² Exports were abnormally high; see text.

³ Estimated foreign value.

Aluminum alloys have a great diversity of uses as structural engineering materials. Relative pre-war consumption in United States industries during 1933-38 was as follows:

<i>Industry</i>	<i>Percent of total consumption</i>
Transportation (land, air, water).....	29
Cooking utensils.....	14
Electrical conductors.....	10
Machinery and electrical appliances.....	15
Building construction.....	8
Chemical.....	5
Miscellaneous foundry and metalworking.....	4
Ferrous and nonferrous metallurgy.....	5
Food and beverage.....	6
General miscellaneous.....	4
Total.....	100

During the 20 years between the two wars, the United States output of aluminum increased at a slightly greater rate than that of other structural metals, except magnesium. This growth was due largely to improvement in the alloys and in fabrication techniques, advertising, and a gradual lowering of prices.

Before the war aluminum accounted for about one-half of 1 percent of all the engineering metals consumed. Steel alone accounted for 94 percent of the total. Steel, glass, and some plastic structural materials have been and are likely to remain cheaper than aluminum alloys, and, therefore, the use of aluminum is likely to be confined to applications in which its physical properties make it especially appropriate. It is uncertain whether aluminum will account for a larger proportion of the total of all engineering metals consumed in the post-war years than before the war; the proportion is not likely to be smaller.

United States production of aluminum (primary and secondary) for the period 1935-39 averaged about 177,000 tons annually, roughly double the average of the preceding 10 years. Exports of crude metal and scrap for the same period averaged about 1,300 tons annually, or somewhat less than 1 percent of domestic production. In addition the United States has exported regularly substantial quantities of aluminum in fabricated form, manufactured from material imported, principally from Canada, under draw-back provisions. Exports were several times larger in 1939 than the average for 1935-38, presumably because of preparations for war in foreign countries. The United Kingdom, France, the Soviet Union, and Belgium were the principal markets in crude metal for United States exports in 1939.

United States imports for consumption during the period 1935-39 averaged about 12,500 tons annually, equivalent to about 7 percent of domestic consumption. Canada, Norway, France, and Switzerland were the main sources of imports, which consisted of crude and semicrude forms.

The war demand for aluminum for aircraft and other military uses resulted in an eightfold increase in United States capacity. Private capacity (ingot metal) reached about 500,000 tons in 1943, and plants built by the Government and leased to private operators had a capacity of 616,000 tons. The United States and Canada together now have a capacity much larger than the pre-war world total.

At the close of the war, a very large supply of aluminum in all forms¹ will be on hand in the United States, equivalent to perhaps from 3 to 5 years of pre-war primary production. Many of the war uses require alloys of a type not used extensively in peacetime; thus much of the partially fabricated material in stock will have doubtful value for immediate civilian purposes. The accumulation of war scrap in the form of crashed aircraft and obsolete planes will be large, but full utilization of this material will require improvements in present technology. Canada and the United Kingdom also will have stocks of both primary metal and scrap.

During the 1920's and 1930's imports of aluminum into the United States were probably less affected by the duty (4 cents per pound before 1939) than by corporate relationships between domestic and foreign producers and by cartel organizations.

If all the capacity for the production of aluminum created in the United States during the war remains capable of operation after the war, this country will almost certainly have capacity far in excess of the maximum probable demand. Even if a considerable part of the plants built by the Government during the war should cease to operate, there might still be an excess of capacity. An excess of capacity in this country, however, does not preclude the possibility of importation of aluminum. Imports, if any, would be most likely to come from Canada. During the war there has been a great increase in Canadian aluminum capacity, which is still owned by a single producing company. It is now many times greater than Canada's requirements for finished aluminum products, and although there has also been a marked expansion in fabrication plants in Canada during the war, the utilization of the whole, or the greater part, of the primary-metal capacity will be possible only if large quantities of the unfabricated metal are exported.

Although costs of production of aluminum in the more favorably situated plants in the United States are probably lower than costs in most European countries, they are probably somewhat higher than Canadian costs. Canada obtains its bauxite almost entirely from British Guiana. The greater part of United States consumption of bauxite before, as well as during the war, has been obtained from Dutch Guiana (Surinam), where presumably costs are about the same as those in British Guiana. The principal aluminum plants in Canada are able to receive their bauxite directly by sea; this is not true of most plants in this country. In Canada bauxite is free of duty, whereas in the United States it is subject to a duty (\$1 per ton) which is, however, equal to only about one-fifth of 1 cent per pound of aluminum. The principal advantage which Canada possesses for the production of aluminum consists in the abundance of cheap water power.

It is possible to forecast, though only very roughly, how much aluminum would be imported from Canada into the United States in the post-war period if there were no relationships of common ownership between United States and Canadian producers. It is impossible to forecast whether the relationships which existed before the war will persist in the post-war period. If they should remain substantially unchanged, the extent to which aluminum would move from Canada to the United States would probably be determined more by the policy of the two great companies concerned than by the rate of duty.

¹ Including ore and alumina

notwithstanding the fact that production in the United States is no longer practically confined to a single company.

In the pre-war period there were also relationships, more or less indirect, between the principal United States aluminum producer and certain producers in continental Europe. Cartel organization was a conspicuous feature of the European aluminum industry. It is obviously impossible to forecast what will be the situation in these respects in the post-war period; it may be affected by national legislation or by international government measures regarding cartels. World trade in aluminum after the war may also be affected by economic and political conditions in Germany, which before and during the war has been far the largest European producer, and by the policy of the United Nations toward German industries.

Whatever may happen in the future with regard to importation of aluminum into this country for final retention here, there will probably be an appreciable importation of crude and scrap aluminum for conversion into shapes in this country and export with benefit of draw-back.

POST-WAR SHORT TERM

Excess capacity and large accumulation of stocks in the United States, in Canada, and in certain European countries, may have a depressing effect on the price and production of crude aluminum in the United States during this period. Presumably consumption in this country will be much larger than before the war, both because of assumed high national income and because of the big backlog of demand for civilian commodities containing aluminum which could not be supplied during the war. However, even if consumption should be two or three times the 1939 figure, and even if none of the large accumulated stocks are thrown on the market, not more than 30 or 40 percent of the present total United States capacity will be required. Nevertheless, if the only factor limiting imports in this period should be the present rate of duty, there would probably be some imports from Canada; imports from Europe would be insignificant, particularly in view of the strong demand in Europe for rehabilitation purposes.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

It is likely that the pre-war upward trend in consumption will continue, both because uses for aluminum are still in process of development and because production costs and prices are likely to continue to decline. Total consumption of primary and secondary aluminum might, taking account of increase in population and new uses, be from 60 to 80 percent greater than in 1939 (195,000 tons), amounting to somewhere between 310,000 and 350,000 tons. Secondary production, with a consumption of this magnitude, would probably be about 80,000 tons, so that consumption of primary aluminum might be 230,000-270,000 tons. The mean of these two figures, 250,000 tons, is used as a basis in the following estimates regarding imports and domestic production. It is improbable that any change in price resulting from an increase or decrease of 50 percent in the rate of duty would be of sufficient magnitude to affect

the quantity consumed by more than 1 or 2 percent, and in the following estimates no allowance is made for such an effect on consumption.

If the only factors affecting imports were the comparative domestic and foreign costs of production and the rates of duty, it seems likely that with the duty as in 1939 imports would be 20,000–35,000 tons (roughly 5–10 percent of consumption); that with the duty reduced by 50 percent imports, not including those for reexport with benefit of draw-back, might be about twice as great, or, say, 40,000–70,000 tons; and that with the duty increased by 50 percent they would probably be 15,000–20,000 tons. The foreign unit value of imports might be somewhat lower than in 1939, when it amounted to 12 cents per pound (\$240 per ton). Assuming it to average 11 cents per pound, the value of the imports under the foregoing assumptions would be about as follows:

With the duty as in 1939, 4.4–7.7 million dollars;

With the duty reduced by 50 percent, 8.8–15.4 million dollars;

With the duty increased by 50 percent, 3.3–4.4 million dollars.

Primary production in the United States includes, besides metal for final consumption in this country, a certain quantity exported as shapes. On the basis of the above estimates concerning consumption and imports, the primary production for the domestic market would be somewhat as follows:

With the duty as in 1939, 215,000–230,000 tons;

With the duty reduced by 50 percent, 180,000–210,000 tons;

With the duty increased by 50 percent, 230,000–235,000 tons.

The price of the domestic product might be somewhat affected by the rate of duty. In view of the fact that the price of aluminum was reduced during the war to 15 cents per pound, it is not likely that, with per capita income as in 1939 and the duty as in 1939, the price in the post-war period would exceed 14 cents. A reduction of 50 percent in the duty (although the reduction would be 1½ cents per pound) would probably not result in a lowering of the domestic price by more than one-half cent, or say, to 13½ cents. With an increased duty the price might be about 14½ cents. On the basis of these assumptions regarding prices, the value of the production of primary metal for domestic consumption would be as follows:

With the duty as in 1939, 60.2–64.4 million dollars;

With the duty reduced by 50 percent, 48.6–56.7 million dollars;

With the duty increased by 50 percent, 66.7–68.2 million dollars.

Per capita income 75 percent higher than in 1939.

A high level of national income would tend to increase the consumption of all classes of commodities containing metals, which consist mainly of producers' capital goods and of consumers' capital goods; most of the latter are above the level of basic necessities. Large quantities of aluminum are used in building construction and transportation equipment, and it is probable that an increase in national income would particularly stimulate these uses. Anticipated large use of aluminum foil for packaging under high income conditions would also be an important factor. Under these conditions, consumption of aluminum (primary and secondary) in the United States might be approximately 60–70 percent higher than with no change in income, say, about 530,000–600,000 tons. Secondary production might be about 140,000 tons and consumption of primary

metal 390,000-460,000 tons. The intermediate figure of 425,000 tons is used as a basis for the following estimates.

Even the very large total consumption estimated above would be less than the present capacity of the United States aluminum industry. Imports, however, would presumably occur if trade depended only on cost differentials as between the United States and foreign countries, especially Canada, even if the 1939 rate of duty should be increased by 50 percent. Imports under each of the three assumptions regarding the rate of duty might be approximately twice as great as the figures presented above on the basis of income as in 1939.

Prices of aluminum both in the United States and in foreign countries would probably be only moderately higher with a national income 75 percent above the pre-war level than with an unchanged income, perhaps not more than 1 cent per pound higher, for the reason that the very large output would tend to reduce costs. The average foreign unit value of imports might thus be around 12 cents (\$240 per ton). The quantity and value of imports under the three assumptions regarding duties would, therefore, probably be within the following ranges:

- With the duty as in 1939, 50,000-100,000 tons, with a foreign value of 12-24 million dollars;
- With the duty reduced 50 percent, 100,000-200,000 tons, with a value of 24-48 million dollars;
- With the duty increased 50 percent, 25,000-50,000 tons, with a value of 6-12 million dollars.

The production of primary metal in the United States for the home market may be estimated on the basis of above figures of consumption and imports. The domestic prices of the metal under the three assumptions regarding rate of duty might be respectively 15 cents, 14½ cents, and 15½ cents per pound. The resulting figures of production, in quantity and value, would be approximately as follows:

- With the duty as in 1939, 325,000-375,000 tons, with a value of 97.5-112.5 million dollars;
- With the duty reduced 50 percent, 225,000-325,000 tons, with a value of 65.3-94.3 million dollars;
- With the duty increased 50 percent, between 375,000 and 400,000 tons, with a value of 116.3-124.0 million dollars.

Summary of estimates.

Tables 1 and 2 summarize the foregoing estimates of consumption, imports, and production.

TABLE 1.—Aluminum: Estimated post-war consumption, imports, and production under the assumptions of Senate Resolution 341

[Thousands of short tons]

Period, income level, and tariff treatment	Consumption			Imports, primary	Production for domestic market, primary
	Total	Secondary	Primary		
1939.....	203			10	164
Post-war long term:					
Per capita income as in 1939:					
Duty as in 1939.....	330	80	250	20-35	215-230
Duty reduced by 50 percent.....	330	80	250	40-70	180-210
Duty increased by 50 percent.....	330	80	250	15-20	230-265
Per capita income 75 percent higher than in 1939:					
Duty as in 1939.....	565	140	425	50-100	325-375
Duty reduced by 50 percent.....	565	140	425	100-200	225-335
Duty increased by 50 percent.....	565	140	425	25-50	375-400

TABLE 2.—Aluminum: Summary of estimated post-war production and imports under the assumptions of Senate Resolution 341

Period, income level, and tariff treatment	Production for domestic market, primary			Imports		
	Quantity	Price per ton	Value	Quantity	Price per ton	Foreign value
	1,000 tons		Million dollars	1,000 tons		Million dollars
1939.....	164	1 394	65	10	\$294	2.9
Post-war long term:						
Per capita income as in 1939:						
Duty as in 1939.....	215-230	280	60.2-64.4	20-35	220	4.4-7.7
Duty reduced by 50 percent.....	180-210	270	48.6-56.7	40-70	220	8.8-15.4
Duty increased by 50 percent.....	230-235	290	66.7-68.2	15-20	220	3.3-4.4
Per capita income 75 percent higher than in 1939:						
Duty as in 1939.....	325-375	300	97.5-112.5	50-100	240	12-24
Duty reduced by 50 percent.....	225-325	290	65.3-94.3	100-200	240	24-48
Duty increased by 50 percent.....	375-400	310	116.3-124.0	25-50	240	6-12

1 Price was reduced during the war to \$300.

Exports

Before the war, except in 1939, the United States exported very little crude aluminum, though it had appreciable exports of fabricated shapes as well as more highly elaborated aluminum articles such as cooking utensils. Since the import trade in crude aluminum, unless restricted by corporate relationships between domestic and foreign concerns, is likely to be materially larger in quantity in the post-war period than before the war, there seems little reason to expect any considerable exportation of unfabricated aluminum. Limited quantities may go to some of the Latin American countries.

This report does not, in general, cover aluminum shapes, but it may be stated that there is likely to be a moderate export of such shapes in the postwar period, notwithstanding the great expansion of Canada's capacity for the manufacture of shapes. Some, at least, of the exports of shapes are likely to be made from crude aluminum imported from Canada, the duty being subject to drawback when the products are exported.

Employment

During 1944 employment in the aluminum industry proper—that is, in the conversion of bauxite into alumina and the conversion of alumina into aluminum metal—numbered about 17,250 persons (the employment in fabricating plants was very much larger but this branch of the business is not covered by the present report). The number of persons employed in the long-term post-war period will presumably be materially smaller, probably around 5,000 persons. Employment will, of course, depend to a considerable extent on the volume of output, estimates concerning which have already been presented. However, a given increase in the production of primary aluminum is not likely to carry with it a fully corresponding percentage of increase in employment; the reverse would hold true of a decrease in production.

ANTIMONY

Traiff paragraph	Commodity	Rate of duty	Equiva- lent ad valorem (1939)
376	{ Antimony, as regulus or metal	2¢ per lb.	21.2%.
	{ Liquated antimony	1/4¢ per lb.	3.8%.
1808	Antimony ore	Free	

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Mine pro- duction	Imports	Apparent consump- tion	Ratio of imports to consump- tion
<i>Percent</i>				
Quantity (short tons antimony content):				
Antimony ore	393	9,448	9,841	96
Liquated		160	160	100
Regulus		1,045	1,045	100
Total	393	10,653	11,046	97
Value (\$1,000):				
Antimony ore	97	\$ 1,132		
Liquated		\$ 30		
Regulus		\$ 197		
Total	97	\$ 1,359		
Unit value (cents per pound antimony content):				
Antimony ore	12.35	\$ 5.99		
Liquated		\$ 9.41		
Regulus		\$ 9.42		
Average	12.35	\$ 6.38		
Persons employed (number)	300			

¹ Includes 232 short tons of antimony used after importation in making certain articles which were exported with benefit of draw-back of duty.

² Foreign value.

NOTE.—Antimony ore is not to be confused with antimony-bearing lead ores; much of the antimonial lead produced in the United States is smelted directly from imported antimony-bearing lead ores, the antimony content of which is not included in this report.

Antimony, as a constituent of antimonial lead, is used in the manufacture of storage-battery plates, antifriction bearings, and type metal; as an oxide, it is used in flameproofing heavy textiles such as canvas; and in metallic form it is used in the preparation of certain industrial chemicals.

The United States, although ranking third as a consumer of antimony, is almost entirely dependent upon foreign sources for its supply. Only 3 percent of the consumption in 1939 was obtained from domestic ores. Of the imports, ores (principally from Mexico) accounted for 90 percent; regulus or antimony metal (from China, Mexico, and Belgium) accounted for 9.8 percent; and liquated antimony or crude antimony sulfide (from the United Kingdom and China) accounted for the remainder.

China has long been the largest producer of antimony in the world and until 1932 was the principal source of imports into the United States. In 1931 an antimony smelter was erected in the United States by British interests to process imported ore which is duty-free. The metal produced by this smelter was sold on the United States market in competition with imported Chinese regulus which was dutiable at 2 cents a pound, and soon practically displaced the Chinese metal.

It is generally accepted that this smelter is able to compete with the Chinese metal only because of the duty on the regulus, which in 1939 was equivalent to 21 percent ad valorem.

Domestic production of antimony ores was negligible before 1932 because of the lack of smelting facilities. Although a large smelter now exists, post-war domestic production of ore will probably not exceed 600 short tons a year because of limited deposits in this country.

POST-WAR SHORT TERM

Consumption will probably be almost twice the consumption in 1939, reflecting the large backlog of demand for products in which this metal is used. Imports may be very large or very small, depending upon the policy followed by the United States Government in disposing of its wartime stock pile of antimony, which at the end of the war is likely to equal twice the 1939 rate of consumption. If the Government disposes of this stock pile rapidly and at low prices, imports of antimony in the first year or two after the war will be very small. If, on the other hand, the Government withholds all or a large part of the stock pile from the market, imports might be twice as large as in 1939. Whether imports of antimony in the immediate post-war period will be in the form of ores or metal will depend upon the policy followed by the Chinese Government. Should that Government, in order to obtain dollar exchange, drastically reduce the price of regulus, imports of ores would be negligible. Otherwise imports are likely to be largely in the form of ore from Mexico.

POST-WAR LONG TERM

Consumption, production, and imports

The post-war consumption of antimony (except, perhaps, at very high levels of national income) is likely to follow closely the activity of the automotive industry. Domestic consumption and production probably would not be materially affected by a 50-percent increase or decrease in the rates of duty; total imports of antimony likewise would probably not be significantly affected, but a 50-percent reduction in the duties would probably mean that imports would consist entirely or almost entirely of antimony in the form of regulus and a 50-percent increase in the duties would probably mean that imports would consist almost entirely of antimony in the form of ores. Thus the foreign value of imports would be materially affected by changes in the duties, as the unit value of antimony in regulus is higher than the unit value of antimony in ore.

Per capita income at 1939 level.

Because of increase in population, consumption might be about 10 percent greater than in 1939, or in the neighborhood of 12,000 short tons. Domestic production probably would not exceed 600 short tons valued at \$150,000. Imports would amount to about 11,400 short tons, the foreign values of which would vary, depending upon the rate of duty, as indicated below.

Duty as in 1939.—The foreign value of imports, about 90 percent of which probably would be in the form of ore and about 10 percent in the form of regulus, might be about 1.5 million dollars at 1939 prices.

Duty reduced 50 percent.—The foreign value of imports would probably be about 2.3 million dollars as the imports would consist almost entirely of regulus.

Duty increased 50 percent.—Except for a few hundred tons of regulus, imports would consist of ores and total imports of antimony would probably have a foreign value of about 1.5 million dollars.

Per capita income 75 percent higher than in 1939.

Domestic consumption of antimony might be 50 percent greater than in 1939 or about 16,000 short tons. Domestic production would probably be in the neighborhood of 600 tons valued at \$160,000. Imports of antimony would thus amount to about 15,400 short tons, the foreign value of which would depend upon the duties in effect as indicated below.

Duty as in 1939.—The foreign value of imports, about 90 percent of which would be in the form of ores and 10 percent in the form of regulus, might be in the neighborhood of 2.3 million dollars, allowing for the higher prices that are likely to prevail under a larger national income.

Duty reduced 50 percent.—The foreign value of imports, all of which would probably consist of regulus, might amount to about 3½ million dollars.

Duty increased 50 percent.—The foreign value of imports, which, except for a few hundred tons of regulus, would consist of ores, would probably be about 2.4 million dollars.

Exports

Exports of antimony obtained from domestic ores have been negligible and will probably continue so in the post-war period.

Employment

The maximum post-war employment in the antimony industry in the United States will probably not exceed 350 persons, of whom 50 may be employed in mining domestic ores and the rest in smelting both domestic and imported ores.

BISMUTH

Tariff paragraph 377.
Commodity: Bismuth (metal only).
Rate of duty: 7½% ad val.

NOTE.—The rate shown above is that fixed in the Tariff Act of 1930. This rate was reduced to 3¼ percent ad valorem, effective July 29, 1942, pursuant to the trade agreement with Peru.

GENERAL

Data on United States imports for 1939 are given below:

Quantity (1,000 pounds)	183
Value (\$1,000)	154
Unit value (per pound)	\$0.85

† Foreign value.

No data have been published in the past concerning domestic production, consumption, or exports.

Bismuth is used chiefly for making pharmaceuticals, and for metallurgical products such as low-melting-point alloys, solder, and bearing metal. It is also used in aluminum and magnesium alloys to improve their machinability. Before the war about 70 percent of the

total consumption was in medicinals. The war created an unusual demand for bismuth for Army and Navy medicinals, ammunition solder, metallurgical applications, use in master patterns, and for testing and bending gasoline and oil tubes in aircraft assembly. Domestic requirements are estimated to have doubled, reaching over 2 million pounds.

There are only three regular producers of bismuth in the United States, all of whom recover bismuth as a byproduct of lead and copper smelting and refining. It is estimated that since 1923 yearly output has ranged from 250,000 to 1.4 million pounds. Much of this production, however, was from foreign ores, lead-base bullion, and residues imported for smelting and refining. The United States output is uneven from year to year because the residues are stored and then treated only when market and refining conditions are favorable. To some extent bismuth production varies with the output of lead, although at very high levels of lead smelting the ratio of bismuth production to lead production tends to decrease somewhat. Consumption of domestic bismuth in 1940 is estimated to have been about 650,000 pounds.

During 1932-40 imports, mostly from Peru, ranged from 19,000 to 183,000 pounds yearly. In addition to imports classified as bismuth metal, substantial but unrecorded quantities of the metal contained in lead bullion (par. 392) were imported. This bullion is estimated to have contained from 200,000 to 400,000 pounds or more of bismuth annually. (This is included in the domestic production.) Much of the bullion from which this bismuth was derived was a special type with high bismuth content, often nearly 50 percent; this type came from Mexico and Peru. Upon the outbreak of war, stocks of bismuth-containing residues at United States refineries were greatly depleted. Certain quantities of bismuth ores were purchased from other Latin American countries to supplement the imports from Peru, and by December 1943 the Metals Reserve Company had accumulated a stock pile of over 800,000 pounds, equivalent to about 1 year's supply.

World prices, to a large extent, have been set by the London market and the Peruvian output. In recent years the price has been fairly stable at from \$1 to \$1.25 per pound.

A decrease or increase of 50 percent in the duty on bismuth metal would not appreciably affect consumption or imports since the rate is already low, the demand is fairly inelastic, and much bismuth enters free in ores and lead bullion treated in bond for the recovery of other metals.

POST-WAR SHORT TERM

Wartime metallurgical developments in methods of producing alloyed nonferrous metals and in their uses will probably tend to increase the use of bismuth, one of the alloying metals, in the future. Consumption for medicinals will probably depend chiefly on the growth of population, though new uses may be developed in this field and there may be a larger per capita consumption for established uses. The consumption of alloyed nonferrous metals is materially affected by national income. Assuming that income will be considerably higher in the immediate post-war years than before the war, actual consumption of bismuth may be well above that in the immediate pre-war years, though less than during the war. However,

in many of its wartime applications bismuth has not been used up, and substantial supplies will probably be available in the form of bending alloys and die alloys at the close of the war. Over against this consideration but not entirely offsetting it stands the fact that smelter stock piles of bismuth residues have been greatly depleted in this country.

POST-WAR LONG TERM

Per capita income at 1939 level.

With the trend toward greater use of alloyed nonferrous metals, including presumably those alloyed with bismuth, the increase in population, and possible greater demand for bismuth medicinals, the consumption of bismuth may be 15 to 25 percent greater than in 1939. The proportion supplied by imports and by domestic production cannot be forecast; in any case, much of the domestic production will probably be from high-bismuth lead bullion imported from Mexico and elsewhere.

Per capita income 75 percent higher than in 1939.

At high levels of industrial activity relatively more nonferrous alloys would be used, increasing the demand for bismuth; however, from 50 to 70 percent of the metal will continue to be used as medicinals, wherein the use would probably be less flexible. Consumption, taking account of increase in population, might become 35 to 45 percent greater than in 1939. The proportion supplied by imports in the form of bismuth metal cannot be forecast.

Employment

Employment in United States bismuth production is not recorded since such production is carried on in conjunction with lead and copper smelting and refining, and labor employed in bismuth production alone is not determinable, but is probably very small. Thus, the changes which might occur due to differences in level of activity would be insignificant.

CADMIUM

Tariff paragraph: 378.

Commodity: Cadmium metal.

Rate of duty: 7½¢ per lb.

Equivalent ad valorem (1939): 18%.

NOTE.—The rate fixed in the Tariff Act of 1930 (15 cents per pound) was reduced to 7½ cents, effective January 1, 1939, pursuant to the trade agreement with Canada.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	4,412	none	4,412	310	4,722	Percent 6.6
Value (\$1,000).....	2,603	none	2,603	131		
Unit value (per pound).....	\$0.59		\$0.59	\$0.42		
Persons employed.....	(¹)					

¹ Foreign value.

² Not available.

Metallic cadmium is a byproduct of the smelting and refining of zinc and of the production of lithopone (of which zinc is the principal constituent). Domestic output is derived from the treatment of foreign and domestic zinc ores and also from the treatment of imported cadmium-bearing zinc flue dust (the latter being imported chiefly from Mexico in intracompany shipments of the American Smelting and Refining Company). Although figures are not directly available on the proportion of the total cadmium production derived from each of these sources, the cadmium content of shipments of the Mexican flue dust averaged about one-fourth of the total domestic production during the period 1935-40.

Since there are no commercially exploitable deposits of cadmium ore in either this or other countries, the production of the metal is limited by the amount of activity in the zinc industry, and the maximum output of cadmium may be roughly estimated in terms of output of zinc. The greatest pre-war world production of cadmium was in 1940, when total output was estimated at a little less than 9½ million pounds.

Cadmium is used primarily as a protective coating applied by electrolytic deposition on other metals. The next most important but comparatively minor use for the metal is as a constituent of bearing metals. Together these applications have accounted for more than 90 percent of the domestic consumption of cadmium.

The extensive use of cadmium has dated from the early 1930's, when the automotive industry began to use large amounts in plating and in bearing metals. Before that time the supply had been greater than the demand, and large stocks had accumulated. Beginning about in 1935, the demand far outstripped the current production, driving the price up and depleting stocks. Imports of metal rose rapidly to supplement the domestic supply (which was also augmented by increased imports of Mexican cadmium-bearing flue dust), and were equal to 15 and 20 percent, respectively, of the domestic production in 1936 and 1937. A decline in automobile production, in 1938 cut consumption, and imports declined sharply. Consumption has increased yearly since 1938. During the war substantial amounts of cadmium have also been used for military airplanes.

In general, the United States imported about 10 percent of its consumption of cadmium during the pre-war years. Production tended to lag behind changes in demand, with the result that prices fluctuated widely during periods of heavy demand.¹ Imports of metallic cadmium originated in Canada and western Europe, particularly Belgium, the Netherlands, Poland, and Germany.

POST-WAR SHORT TERM

The greater part (perhaps 80 percent) of the demand for cadmium will come from the automobile industry, principally for electroplating applications. The current estimate for the annual automobile production during this period is about 6 million units, and on this basis the demand for cadmium will probably be about 8 million pounds a year.

¹ Between 1935 and 1940 the price of cadmium varied between a low of 55 cents a pound at the beginning of the period, a high of \$1.42 a pound during part of 1937, and 80½ cents in 1940. A ceiling price of 90 cents a pound was established in 1941. (All of the above prices apply to cadmium sticks; prices of patented platers' shapes, used in the electroplating industry, are approximately 5 cents a pound higher.)

Domestic production will be limited by the amount of zinc residues available for treatment, including both the residues from domestic plants and imported material. It is probable that these residues will be sufficient to supply about 75 percent of the demand, and the balance must be imported, if available, in the form of foreign metal. The bulk of the imported metal will probably originate in Canada and minor amounts will come from the Belgian Congo, a source developed during the war. Imports from Europe, if any, will be small because of wartime destruction of plants and increased demands in the European market.

POST-WAR LONG TERM

Consumption, Production, and Imports

Even if income levels should not increase, demand would probably expand at a rate somewhat greater than the expansion of the domestic supply of raw materials (from both domestic and Mexican zinc treatment plants), in spite of efforts to develop cadmium-rich zinc ores. Although increase in domestic zinc production will probably be limited, world zinc production (and consequently world cadmium production) is expected to be capable of expansion to meet increased post-war demands. For these reasons, a much larger proportion of the domestic cadmium supply than formerly will probably be obtained from imports of foreign metal.

It is probable that under these conditions of supply and demand the minimum post-war domestic price of cadmium (even with no increase in national income) will be about 90 cents a pound (equivalent to the wartime ceiling price and 50 percent higher than the 1939 average price). Consequently, since the world price is largely influenced by the demand for the metal in the United States (the largest consumer), the foreign value² of cadmium may be expected to be increased considerably.

Changes in the United States import duties of 50 percent (3½ cents a pound) in either direction would have very little effect on the domestic production of the metal.

In estimating the probable future demands for cadmium, activity in the automotive industry is taken as the major index, since the major post-war uses of the metal will be closely related to that industry. If the war use of cadmium in military airplanes should carry over into peacetime production of aircraft, it is possible that the estimates given below on consumption and imports might prove somewhat low. Estimates of maximum domestic production of cadmium are derived from the estimates of zinc production (see the section in this series on zinc). These estimates are adjusted to reflect the quantity derived from imports of Mexican cadmium-bearing zinc flue dust.

Per capita income at 1939 level.

The demand for cadmium, on the basis of the estimated long-run automobile production of 4¼–5 million units at this level of national income, may be about 5.6 million pounds or somewhat more than the maximum probable supply which could be produced in the United States at the prices for zinc which would prevail at such an income level. The value of the probable maximum domestic production of

² As used in this section, "foreign value" refers to the estimated value of the material landed in the United States, less duty, there being no satisfactory basis for deducting freight charges.

cadmium (5.2 million pounds) may be about 4.7 million dollars, at a unit value of about 90 cents a pound.

Duty unchanged.—Imports of cadmium metal might amount to 400,000 pounds, with a foreign value of \$260,000 (foreign unit value, 65 cents a pound, or about 50 percent higher than in 1939).

Duty reduced 50 percent.—Imports might be 500,000 pounds, with a foreign value of about \$350,000 (foreign unit value, 70 cents a pound).

Duty increased 50 percent.—The probable imports might be 300,000 pounds with a foreign value of \$180,000 (foreign unit value, 60 cents a pound).

Per capita income 75 percent higher than in 1939.

The demand for cadmium might rise to approximately 8½ million pounds, on the basis of an estimated automobile production of 6-7 million units at this level of income. Domestic production, limited by maximum potential activity in the domestic zinc industry, might be able to supply about 6½ million pounds, having a value of 6.2 million dollars (unit value 95 cents). The remainder, about 2 million pounds, would have to come from abroad. Under these circumstances variations of 3½ cents a pound in the United States import duty on cadmium would not affect the volume of imports. The foreign unit value of imports would probably average 70 cents per pound, being affected only slightly by changes in duty, so that imports might amount to about 1.4 million dollars in value.

Employment

Because the production of cadmium is very closely integrated with other nonferrous metal output, employment directly chargeable to cadmium is not separable from the total persons employed in these industries.

BRONZE TUBES

Tariff paragraph: 381.

Commodity: Bronze condenser tubes.

Rate of duty: 4¢ per pound (plus 4¢ per lb. on copper content, import-excise tax). *Equivalent ad valorem (1939):* 29%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 8 cents per pound, which was reduced to 4 cents, effective January 1, 1939, pursuant to trade agreement with the United Kingdom. The Revenue Act of 1932 imposed an import-excise tax, in addition to the duty, of 4 cents per pound on copper content, effective June 21, 1932 (Internal Revenue Code, sec. 3425).

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	459
Value (\$1,000).....	108

¹ Foreign value.

Bronze tubes are manufactured in large quantities in the United States but condenser tubes of the type imported have been a specialty of a British concern and were not produced before the war in this country. The imported tubes were of a special aluminum-bronze alloy and were purchased directly from the British manufacturer for use in naval vessels. Imports were unusually large in 1939 owing to a special purchase for experimental purposes.

An adequate alloy and a better method of applying the tubes has been developed in the United States since 1939, and the specifications have been changed to fit the domestic product. Under these circumstances it is unlikely that imports of more than \$25,000 will enter the United States after the war. The amount of the trade will not be affected by the levels of national income or changes in tariff rates.

ALUMINUM FOIL

Tariff paragraph: 382 (a).

Commodity: Aluminum foil less than
1/1000 inch thick.

Rate of duty: 11¢ per lb., but not less than 20% nor more than 40% ad val. *Equivalent ad valorem (1939):* 25%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 40% ad valorem, which was reduced to the rate shown above, effective February 15, 1936, pursuant to the trade agreement with Switzerland.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 25,000	1, 133	1 23,867	2, 827	1 26,694	<i>Percent</i> 1 10
Value (\$1,000).....	1 12,000	488	1 11,512	1 1,266		
Unit value (per pound).....	1 \$0.48	\$0.43	1 \$0.48	\$0.45		
Persons employed.....	(¹)					

¹ Estimated. Production data have not been published since 1929.

² Foreign value.

³ Not available.

Aluminum foil is a rolled product of commercially pure aluminum. Very thin foil is sometimes backed with paper and is then dutiable under paragraph 1405 of the Tariff Act of 1930. Aluminum foil is produced in plain, frosted, colored, printed, or embossed types. Primarily because of its attractive appearance and strength, aluminum foil has widespread use as a wrapping material for tobacco and food products. It is also used in radio condensers and in thermal insulation.

Aluminum foil is one of many products of the major manufacturers of ingot aluminum (the basic raw material for foil) and is thus in a favorable position to profit by the research and marketing experience of these large organizations.¹

For a few years before the war, imports ranged from about 1 million to nearly 3 million pounds annually. They have invariably increased in years of increasing business activity. Switzerland has been the chief source of imports since 1935; before that year Germany was the principal source.

The war demand for aluminum foil has led to production at an annual rate in excess of 30 million pounds. Imports have virtually ceased.

¹ According to a recent trade report, eight plants are engaged in the production of aluminum foil.

The post-war market for aluminum foil will depend on the development of new uses and the extent to which it can successfully compete with other products used for similar purposes. As protective wrappers for perishable goods, aluminum foil competes with tin and lead foils, waxed paper, parchment, pliofilm, and cellophane; as an insulating material it competes with asbestos, cork, mineral wool, and paper composition board. The raw material cost of tin is higher than that of aluminum, and the cost of aluminum is higher than that of lead. The general adoption of aluminum foil in the packaging of a single widely distributed product, such as soap, would increase consumption of foil several fold. United States manufacturers are predicting a post-war production far in excess of any previous peacetime output.

POST-WAR SHORT TERM

Civilian demand for aluminum-foil packaging of products is likely to be greater after the war than before the war. Wartime improvement in manufacturing and finishing techniques will doubtless contribute to increased consumption, which may even exceed the high levels of the war period. Most of the consumption will doubtless be supplied by domestic producers.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

It is probable that the per capita consumption of aluminum foil will be greater than in 1939. Lower priced protective wrappers for perishable goods and lower priced insulating materials will continue to compete with the more expensive aluminum foil. But a probable further lowering of aluminum costs, and preference for this particular type of wrapper, may enable aluminum foil to more than hold its own. Allowing for an increase in population, the consumption of aluminum foil might increase to perhaps 35 million pounds annually.

Duty as in 1939.—Assuming imports to have about the same ratio to domestic consumption as before the war, they might total about 4 million pounds annually. The foreign value would perhaps be about 1½ million dollars annually. Domestic production would probably be about 32 million pounds, allowing for exports of 1 million pounds, valued at about \$430,000. Value of production on the basis of unit values in 1939 would be about 15 million dollars annually. This value might be lower if the long-term trend in the price of foil continues downward.

Duty reduced by 50 percent.—Imports might increase considerably, since Swiss manufacturers would be able to sell their fancy grades at substantially lower prices than formerly. Imports might rise to as much as 7 million pounds annually and might have a foreign value of more than 3 million dollars. In this event, production would probably decline correspondingly to perhaps 29 million pounds, valued at about 14 million dollars. However, the lower duty might result in a slight increase in consumption, in which event production would be somewhat larger.

Duty increased by 50 percent.—It is doubtful whether any imports except high-grade specialties would enter. Imports would perhaps not exceed 1 million pounds, with a foreign value of somewhat more than half a million dollars. Domestic production would then probably be in the neighborhood of 35 million pounds, with a value of perhaps 17 million dollars.

Per capita income 75 percent higher than in 1939.

Increased national income and the desire of manufacturers to package their products attractively would possibly increase consumption to as much as 60 million pounds, or about 70 percent more than with no change in income. Export markets might increase to twice their volume at the lower income level and result in exports of about 2 million pounds.

Duty as in 1939.—On the basis of the same ratio to domestic consumption as under the lower level of income, imports would perhaps increase to about 7 million pounds. Unit values being somewhat greater than in 1939, the total foreign value of imports might reach 3.5 million dollars. With this volume of imports, a domestic production of 55 million pounds would be necessary to meet estimated requirements for consumption and exports. With slightly increased unit values over 1939, total value of production would perhaps be about 30 million dollars.

Duty reduced by 50 percent.—Imports would increase considerably, perhaps to a total of 12 million pounds annually, with a foreign value of slightly more than 6 million dollars. Consumption might be somewhat greater, so that domestic production might be in excess of 50 million pounds annually, valued possibly at about 23 million dollars.

Duty increased by 50 percent.—Only the higher-priced specialties would be imported, thus reducing imports probably to about 2 million pounds annually, and permitting production to rise to perhaps 60 million pounds. Foreign value of imports might be somewhat in excess of 1 million dollars, and value of production about 33 million dollars.

Exports

With lower production costs after the war, larger exports than previously may be expected so long as German and other lower cost products are out of the market. Otherwise, keen competition can be expected as formerly in foreign markets. At the higher income level exports might be twice as large as in 1939 and be valued at about \$980,000. An unknown amount of aluminum foil is exported annually in the form of wrappings of packaged goods.

Employment

Employment in the foil branch of the aluminum industry is small; total production of foils of all kinds, including lead, tin, aluminum, and composition foils (approximately 81 million pounds, valued at 19 million dollars) required the services of only 1,328 workers in 1939. If the per capita national income should rise 75 percent above 1939, employment in the foil industry might increase to about 2,000 persons.

TINSEL PRODUCTS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
385-----	Tinsel products:		
	Wire.....	6¢ per lb. + 10% ad val.....	} 30%.
	Lame or lahn, bullions and metal threads.....	6¢ per lb. + 20% ad val.....	
	Beltings and other articles, not specially provided for.....	30% ad val.....	
	Woven fabrics, ribbons, and tassels.....	40% ad val.....	

Note.—Braids of tinsel, loom woven, and embroideries are dutiable in par. 1939 (a) of the Tariff Act of 1930. Only the rates shown above on tinsel wire and lame or lahn are those fixed in the Tariff Act of 1930. The original Tariff Act rates on bullions and metal threads, beltings, etc., and on woven fabric, ribbons, and tassels, were 6 cents per pound plus 35 percent, 45 percent, and 55 percent, respectively, which were reduced to the rates indicated above, effective June 15, 1936, pursuant to the trade agreement with France.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production	Imports	Apparent consumption	Ratio of imports to consumption
Value (\$1,000).....	1 5,000	1 600	5,000	Percent 11
Persons employed (number).....	1 1,000			

1 Estimated from unpublished data.
 2 Landed value; foreign value was \$435,000.
 3 Estimated.

The United States produces the bulk of its requirements of tinsel products used in the production of coarse varieties of goods such as metallic string, tassels, fringes, electric cord, and fabrics for garment linings and draperies. United States requirements for the finest grades of raw materials and finished goods are mostly supplied by imports. The demand for metallic dress goods and decorations is greatly affected by style. Dress fabrics of gold and silver lame are relatively high priced and limited in demand.

In 1939, imports of raw materials used in the production of tinsel products, such as bullions and metal threads, lame or lahn (flattened wire), and tinsel wire, constituted 68 percent of the total value of imports of this group, and finished articles (woven fabrics, ribbons, tassels, and beltings), constituted 32 percent. France supplied 85 percent of the total value of imports, and Germany nearly all of the remainder.

The demand for tinsel gift-packaging materials and for dress and drapery fabrics is likely to increase with a rise in the national income. In depression periods the demand for these materials declines sharply, but staple lines, such as metallic string, electric-light cords, and Christmas-tree decorations, help to sustain the market.

During the war, imports have been drastically reduced, and domestic production of tinsel products for civilian use has been curtailed.

POST-WAR SHORT TERM

Consumption of decorative metal products such as those considered here may increase substantially after the war. The bulk of the demand, as in recent pre-war years, will probably be supplied by domestic producers. It is not likely that, in this period, imports will be as large as in 1939, because of the time that will be required before the foreign producers can resume exporting on a substantial scale.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

It is probable that the per capita consumption would not differ greatly from that of pre-war years, but as a result of an increase in population, consumption would probably be larger by about 10 percent.

Duty as in 1939.—Imports might have a landed value of \$670,000 (\$480,000 foreign value) and production for the domestic market might be valued at about 5.5 million dollars.

Duty reduced by 50 percent.—Relatively larger imports of raw materials might be expected, as United States manufacturers of finished goods would probably find it profitable to obtain a larger proportion of their requirements abroad. Imports might have a landed value of \$840,000 (\$670,000 foreign value) annually, or about 25 percent more than with the duty unchanged, and production for the domestic market might be valued at perhaps 5.4 million dollars.

Duty increased by 50 percent.—Imports might have a landed value of \$460,000 (\$300,000 foreign value), or about 30 percent less than with the duty as in 1939. In this event, production for the domestic market might be valued at about 5.6 million dollars.

Per capita income 75 percent higher than in 1939.

At this higher income level, the demand for these products might be decidedly higher and might be met by substantial increases in both domestic production and imports.

Duty as in 1939.—Imports might be 85–90 percent larger than under the lower income assumption, with a landed value of about \$1,260,000 (\$900,000 foreign value) annually. Production for the domestic market might be valued at about 9.5 million dollars.

Duty reduced by 50 percent.—With both a higher national income and a reduction in duty, the fashion for tinsel dress fabrics might create a strong demand, and result in imports with landed value of 1.5–1.6 million dollars (1.2–1.3 million dollars, foreign value) annually, comparable to the 4-year average of the years 1934–37, which is the most recent period of popular demand for these products. Production for the domestic market might be valued at about 9.3 million dollars.

Duty increased by 50 percent.—The higher per capita income would no doubt sustain a relatively high level of consumption, and imports would probably still have a landed value of \$775,000–\$930,000 (0.5–0.6 million, foreign values), or between 25 and 40 percent less than with the duty as in 1939. Production for the domestic market would probably be valued at 9.7–9.8 million dollars.

Exports

Although United States exports of tinsel products are not separately reported, they are known to have been small in the past and will probably be small in the post-war period. Much of the foreign trade has been supplied by European producers.

Employment

Employment during the long-term post-war period might range anywhere between, say, 1,000 and 2,500 persons, depending on assumptions as to national income, tariff duties, and also (in any given year) on style factors affecting the demand for certain items in this group.

MERCURY (QUICKSILVER)

Tariff paragraph: 386.

Commodity: Mercury (quicksilver).

Rate of duty: 25¢ per lb. (equal to \$19 per flask). Equivalent ad valorem (1939): 20%.

GENERAL

Data of United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1,416	92	1,324	266	1,590	Percent 16
Value (\$1,000).....	1,937	137	1,800	1,337		
Unit value (per pound).....	\$1.36	\$1.50	\$1.36	\$1.27		
Persons employed (number).....	721					

¹ Foreign value.

The year 1939 was scarcely representative of United States pre-war production and trade in mercury, production and exports being relatively high and imports and consumption below average. The prevailing price was also above average. The average figures for the years 1933-39 are shown below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Average quantity per year (1,000 pounds).....	1,220	150	1,170	881	2,051	Percent 43
Unit value per period.....	\$1.06	\$1.22	\$1.06	\$0.69		

¹ 4-year average; not separately classified before 1935.

The United States ranks third in world production of mercury, although the long-time trend of production in this country has been markedly downward. Domestic resources are now decidedly limited. During the years 1933-39 imports on the average filled 43 percent of

domestic requirements. The principal sources of imports are Spain, Italy, and Mexico, the first two countries supplying 87 percent of total imports in the past 15 years. The chemical and pharmaceutical industries normally consume the bulk of the supply, followed in turn by the electrical and paint industries. The military forces are now using large quantities of mercury in fulminate (a detonating medium for high explosives), in tracer bullets, and in some pyrotechnics.

The pre-war world output and sale of mercury were controlled to a large degree by the international mercury cartel, composed of the Spanish and Italian producers, which accounted for more than 80 percent of world production.

During the war strong demand and high prices have brought about a temporary marked increase in domestic production from the already limited resources. Since 1940 the Metals Reserve Company and later the United States Commercial Company (a Government agency) have been making purchases abroad, importing the metal duty-free. Domestic mercury was also purchased in large volume. When the stock pile became sufficiently large to meet requirements, domestic purchase contracts were canceled, the mercury conservation order was revoked, and other restrictions removed (February 1944). Domestic production immediately fell off.

POST-WAR SHORT TERM

Consumption will probably be considerably larger than before the war. If little or none of the Government stock pile is liquidated, and if foreign mercury is offered at a price not unduly enhanced by cartel action, imports will probably be from two-fifths to three-fifths of domestic consumption.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption will probably exceed the pre-war levels because of development of new uses and the upward trend in present uses. The use of mercury in drugs, pharmaceuticals, dyes, and in agriculture will probably increase materially. This may be offset in part by the increased use of new drugs such as sulfa and penicillin. The pre-war upward trend in the uses of mercury by the electrical industry, in the manufacture of control and recording instruments, automatic switches, neon tubes, and fluorescent lamps, is expected to continue. A use introduced in 1944, in the manufacture of a new type of long-lasting dry cell for the armed forces which requires mercuric oxide as a prime component, will also increase consumption.

All the estimates presented hereinafter with respect to the imports (and conversely the domestic production) of mercury, under different assumptions regarding national income and rates of duty, are necessarily subject to qualification by reason of uncertainty as to the future existence and policies of an international cartel in this field. If there should be active competition between Spanish and Italian producers, imports into the United States might be different, perhaps materially so, in quantity and in price, than if the pre-war cartel is reestablished. Even if a cartel is in operation, the trade might depend in considerable

degree on the nature of the policies it pursues, whether on its own motion or under governmental influence.

The estimates of United States production are also subject to qualification by reason of another factor of uncertainty, namely, that regarding the extent to which the domestic industry with its limited resources, further depleted by the abnormally large wartime production, can produce mercury after the war at costs low enough to meet the competition of the imported metal. Some of the estimates of production may prove too high on that account. On the other hand, of course, if large new deposits should be discovered, the estimates might be unduly low.

With a 10-percent increase in population, the annual consumption of mercury might approximate 2.5 million pounds, or nearly one-fourth more than the average for the period 1933-39. It is improbable that a decrease or increase of 50 percent in the duty, even if fully reflected in the price of mercury, would affect consumption materially, since it is virtually indispensable in most of its uses.

Duty as in 1939.—If imports should meet about the same percentage of domestic requirements (43 percent) as before the war, they would amount to about 1.1 million pounds, having a foreign value close to \$775,000. Domestic production would then be about 1.4 million pounds, valued at perhaps 1.5 million dollars (both value estimates based on 1933-39 average unit values).

Duty reduced by 50 percent.—If the price in the United States should decline by the full \$9.50 a flask which would be warranted by the reduction in duty, or by the greater part of that amount, imports might increase to about 55 percent of consumption, in which case they would amount to about 1.4 million pounds a year, and have a foreign value of about \$950,000. Domestic production would then be about 1.1 million pounds, valued at about 1.1 million dollars (based on the average 1933-37 unit value less 10 cents per pound); the operation of some deposits in this country would probably be discontinued entirely.

Duty increased by 50 percent.—If the increase in duty were reflected more or less completely in prices, domestic production might be somewhat greater than with an unchanged duty, but, because of the limited reserves of ore and their decreasing metallic content, the increase would probably be small. Production might increase to 60 percent of consumption (57 percent in 1933-39), or around 1.5 million pounds a year, with a value of around 1.7 million dollars, based on a unit price about 10 cents above the pre-war average. Imports would then be in the neighborhood of 1.0 million pounds, having a foreign value of about \$700,000, assuming that the foreign producers would not reduce their prices materially below pre-war levels.

Per capita income 75 percent higher than in 1939.

Although an increase in national income would have little effect on the consumption of mercury in some of its uses, in others the effect would be marked. Total consumption might approximate 3.2 million pounds annually, or 25-30 percent more than with unchanged income.

With such a large increase in demand, together with the probable general advance in commodity price levels which would accompany such a high national income, the prices of mercury might, on the

assumption of no change in duty, be around one-fifth higher than with an unchanged income. The price of the domestic product might be around \$1.25 per pound (\$1.06 in 1933-39), and the foreign price of imports around 80 cents (69 cents in 1933-39). It is possible that a reduction or an increase of one-half in the duty might affect somewhat both the price of the domestic product and the foreign price of the imports. Because of the strength of the demand, however, the effect would be relatively much less marked than in the case of such changes in duty with national income as in 1939, and in the following estimates no adjustment of values has been made on this account.

Duty as in 1939.—Additional domestic production would probably contribute little to the increased consumption. It might rise to 1.5 million pounds, with a value of perhaps 1.9 million dollars. Imports would then be in the neighborhood of 1.7 million pounds, with a foreign value of perhaps 1.4 million dollars.

Duty reduced by 50 percent.—If the price of imported mercury should be lower by the full amount of the duty reduction (which is not at all certain because of cartel control), imports would increase to perhaps 2 million pounds annually, or nearly two-thirds of domestic consumption. The foreign value of such imports might be about 1.6 million dollars. Domestic production would decline by about the same quantity that imports increased. Production might thus total about 1.2 million pounds annually, valued at about 1.5 million dollars.

Duty increased by 50 percent.—Domestic production would probably be only slightly greater than with no change in duty, amounting to perhaps 1.6 million pounds, valued at 2.0 million dollars. In that case imports would probably also be about 1.6 million pounds, having a foreign value of perhaps 1.3 million dollars.

Summary of estimates.

The foregoing estimates are summarized in tables 1 and 2.

TABLE 1.—Mercury: Estimated quantities of consumption, imports, and production under the assumptions of Senate Resolution 341

[In thousands of pounds]

Period, income level, and tariff treatment	Consumption	Imports		Domestic production
		Quantity	Percent	
1936-39.....	2,050	880	43	1,170
Post-war long term:				
Per capita income as in 1939:				
Duty as in 1939.....	2,500	1,100	44	1,400
Duty reduced by 50 percent.....	2,500	1,375	55	1,125
Duty increased by 50 percent.....	2,500	1,000	40	1,500
Per capita income 75 percent higher than in 1939:				
Duty as in 1939.....	3,200	1,700	53	1,500
Duty reduced by 50 percent.....	3,200	2,000	62½	1,200
Duty increased by 50 percent.....	3,200	1,600	50	1,600

TABLE 2.—Mercury: Summary of estimated post-war production and imports under the assumptions of Senate Resolution 341, in quantity and value.

Period, income level, and tariff treatment	Production			Imports		
	Quantity	Unit value	Value	Quantity	Unit value †	Value †
	1,000 pounds [‡]	Per pound \$1.06	1,000 dollars	1,000 dollars	Per pound \$0.69	1,000 dollars
1933-39.....	1,170		1,240	881		608
Post-war long term:						
Per capita income as in 1939:						
Duty as in 1939.....	1,400	1.06	1,475	1,100	.70	770
Duty reduced by 50 percent.....	1,125	.96	1,090	1,375	.70	960
Duty increased by 50 percent.....	1,500	1.16	1,740	1,000	.70	700
Per capita income 75 percent higher than in 1939:						
Duty as in 1939.....	1,500	1.25	1,875	1,700	.80	1,360
Duty reduced by 50 percent.....	1,200	1.25	1,500	2,000	.80	1,600
Duty increased by 50 percent.....	1,600	1.25	2,000	1,600	.80	1,280

† Foreign value.
‡ Less exports.

Exports

In the past, United States exports have been relatively small, as competition in the world markets with foreign mercury is severe. It is not likely that this condition will change.

Employment

Peak employment, reached early in 1944, was approximately 1,270 men, an increase of 76 percent over 1939. On the basis of the estimates given above, employment in the long-term post-war period may range between 450 and 600 persons.

NICKEL

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1734.....	Nickel ore, matte, and oxide.....	Free.....	
389.....	Nickel and alloys, chief value of nickel (pigs, ingots, shot, cubes, grains, cathodes, or similar forms).	2½¢ per lb.....	10%

NOTE.—The rate on nickel and alloys in pigs, ingots, etc., was fixed in the Tariff Act of 1930 at 3 cents per pound, and was reduced to 2½ cents per pound, effective January 1, 1939, pursuant to trade agreement with Canada. Nickel scrap was made duty-free effective March 14, 1942, until the termination of the national emergency.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Primary production	Reexport ¹	Production for domestic market	Imports	Apparent consumption
Quantity (1,000 pounds, nickel content).....	788	1,627	(²)	129,375	123,536
Value (\$1,000).....	(³)	(²)	(²)	\$28,975	
Unit value (per pound).....				\$0.224	

¹ Exports of imported nickel contained in nickel, monel metal, and alloys with benefit of draw-back of customs duties. Does not include the large exports of more advanced manufactures with benefit of draw-back.

² Not available.
³ Foreign value.

The year 1939 was one in which imports, exports, and apparent consumption were abnormally high, partly because of demands here and abroad in preparation for war; average data for the period 1937-39 are given below:

Item	Primary production	Reexport ¹	Production for domestic market	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds of nickel content)...	686	524	(²)	99,102	98,964	<i>Percent</i> 100
Value (\$1,000).....	(³)	(³)	(³)	22,000		
Unit value (per pound).....				\$0.22		

¹ Exports of imported nickel contained in nickel, monel metal, and alloys, with benefit of draw-back of customs duty. Does not include the large exports of more advanced manufactures with benefit of draw-back.

² Not available.

³ Foreign value.

Nearly all United States imports of primary nickel normally come from Canada. Domestic production of primary nickel, all a by-product of gold and copper refining, accounts for less than 1 percent of the apparent consumption. The future primary domestic production will probably continue to be unimportant regardless of changes in national income, activity in gold or copper refining, or in tariff treatment.

Normally about one-quarter of the aggregate imports of nickel in all forms enter the United States duty-free (as content of raw materials, principally Canadian nickel ore or nickel-copper matte), for the domestic production of the special nickel-copper alloy called monel metal. The balance of the imports is in the form of nickel metal, which is subject to duty. During the war, as a result of production developed in Cuba through United States Government assistance, appreciable quantities of nickel oxide have entered duty-free for domestic refining into metallic nickel. This development is not expected to continue after the war in the face of very serious competition by imports of metallic nickel from Canada, although strenuous efforts are being made to create a market for the direct use of the nickel oxide in the steel industry.

Most of the Canadian nickel metal (as well as the nickel matte) imported into the United States is the product of the International Nickel Company of Canada, Ltd., the dominant world producer. This company is largely under United States financial control and imports should be regarded as intracompany transactions because they are principally for further treatment and fabrication in company-owned plants in the United States. The United States is the principal market for Canadian metallic nickel and is the sole market for the monel matte.

The quoted domestic price of nickel has remained constant at 35 cents a pound at New York since 1928, even during the war years, although there have been some variations in the London price. The reduction of the tariff rate from 3 cents to 2½ cents a pound by the Canadian Trade Agreement of 1939 was not reflected in a lower United States price for nickel.

The principal consumption of nickel is in the manufacture of alloy steels which are largely used in consumers' durable goods, such as

automobiles, and in the production of heavy mechanized equipment. Monel metal is used in the automobile industry and in the manufacture of corrosion-resistant equipment in the chemical industry and other applications where the handling of corrosive materials is involved. The automotive industry absorbed about one-fourth of the total supply of nickel in the immediate pre-war years and the quantity imported into the United States during the years 1930-39 showed a close relation to automobile production which, in turn, responded to changes in per capita national income. Because other large consuming industries are, to a great extent, subject to the same demand considerations as the automobile industry, and because there is an established technological demand for nickel and a lack of satisfactory substitutes in the production of alloy steels, it is probable that the future per capita demand for the metal will reflect, at least roughly, changes occurring in general business activity.

Official statistics record exports of about 19,000,000 pounds of nickel manufactures in various forms in 1939. In view of the small domestic production of primary nickel, it is obvious that the greater part of the exports were processed in the United States from imported materials. Therefore, apparent consumption can be obtained by deducting from the sum of the imports and production that part of the exports which is in the form of nickel metal, monel metal, and alloys, which in 1939 amounted to 1.6 million pounds. There were no exports of nickel ore, matte, or oxide. The remainder of the total of nickel exported, amounting to 17.4 million pounds, consisted principally of manufactures of nickel in bars, rods, sheets, etc.

POST-WAR SHORT TERM

In the first few years after the war, it seems likely that consumption and imports of nickel will be 50-75 percent greater than the average of 1937-39, perhaps 150-175 million pounds, valued at 35-40 million dollars. These estimates derive further support from the fact that the production of alloy steels (a major consumption of nickel) is expected to be approximately 100 percent greater than in 1939. A major factor will be the large backlog of deferred demand for automobiles and other articles which are the ultimate consumers of nickel. It is probable that imports of nickel and nickel raw materials will originate almost entirely in Canada, as they did before the war, since imports of nickel oxide will probably cease if Government support is withdrawn from the Cuban development.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption and imports of nickel will be somewhat higher than the average in the period 1937-39 because of the increase in population and the continuance of the pre-war trend toward larger per capita consumption of nickel. Consumption may reach the level of 110-125 million pounds per year valued (at pre-war unit values) at about 25 million dollars.

It is probable that neither a 50-percent increase nor a 50-percent decrease in the relatively low tariff rate on metallic nickel would

substantially affect the volume of imports and consumption, even though such changes were wholly reflected in the price of nickel in the United States.

Per capita income 75 percent higher than in 1939.

It is probable that the imports of nickel would rise roughly in proportion to the assumed rise in per capita national income in the long-term period, since the production of those articles which consume nickel in their end uses is expected to follow in a general way the fluctuations of income. Taking into account the expected increase in population and the pre-war trend toward increased per capita consumption of nickel, imports of the metal may be in the range of 190-230 million pounds. This situation would remain essentially the same should the present level of duty be either maintained, or increased or decreased by 50 percent.

If the pre-war price of nickel were to remain unchanged as during the war, the foreign value of the imports would be 43-52 million dollars. Were the foreign value to advance with the general price level, the value of imports would be considerably greater.

Exports

The exports of nickel not consumed by domestic processing are expected to be insignificant and will probably amount to less than 1 percent of the available supply.

Employment

Employment in the domestic production of nickel and nickel alloys is not separable from employment in the principal industries of which nickel is a byproduct and cannot be determined.

LEAD

Tariff paragraph	Commodity	Rate of duty (Per pound metal content)	Equivalent ad valorem (1939)
391	Lead-bearing ores, flue dust, and matte of all kinds.	1½¢	34.6%
392	Lead bullion and base bullion	2½¢	45.1%
	Lead pigs and bars	2½¢	114.9%
	Reclaimed, scrap, and alloys	2½¢	45.7%

NOTE.—The above rates are those fixed in the Tariff Act of 1930. Lead-bearing ores, etc., and lead and base bullion entered for smelting, refining, and reexport are duty-free under bond. Pursuant to the trade agreement with Mexico, effective January 30, 1943, the rate on ore, etc., was reduced to ¾ cent per pound, and the rate on bullion, bars, pigs, reclaimed, etc., was reduced to 1½ cents per pound, with the proviso that, effective 30 days after the termination of the emergency, the rate on ores, etc., will increase to 1½ cents per pound and the rate on the other products will increase to 1½ cents per pound. Under Public Law 497 of the 77th Congress, effective March 14, 1942, the duty on lead scrap was suspended for the duration of the emergency.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Quantity	Value	Unit value
Production:		1,000 dollars	Per short ton
Primary (from domestic ores and base bullion)	Short tons 420,967	42,518	\$101.00
Secondary	210,800	18,290	86.72
Total, or average	631,767	60,798	96.23

Item	Quantity	Value	Unit value
Imports:		<i>1,000 dollars</i>	<i>Per short ton</i>
For domestic consumption (Including lead entering into articles exported with draw-back of duty).....	<i>Short tons</i> 18,887	\$ 1,400	\$74.60
For smelting, refining, and export.....	76,481	\$ 5,644	\$ 73.80
Total, or average.....	95,368	\$ 7,053	\$ 73.90
Exports:			
Withdrawals from bonded warehouses.....	(¹)		
Refined lead in pigs and bars (domestic product).....	(²)		
Total.....	74,392		
Apparent consumption.....	652,743		
Ratio of imports for domestic consumption to the apparent consumption (percent).....			³
Persons employed (number).....	16,000		

¹ 10,379 short tons of lead entered into articles exported in 1939 with draw-back of duty.

² Foreign value.

³ The statistics for exports in 1939 contain an apparent discrepancy in that the total exports are reported to be less than the withdrawals for export from bonded smelters and warehouses. There were probably no exports of lead produced from domestic ore.

⁴ Estimated.

Because exports and imports in 1939 were abnormally high and because there were wide fluctuations of imports, exports, and domestic production among the individual years of the period 1935-39, it is not possible to give an example of an actual normal year during this period. Data for the average of the entire period are presented below.

Item	Average 1935-39		
	Quantity	Value	Unit value
Production:		<i>1,000 dollars</i>	<i>Per short ton</i>
Primary (from domestic ores and base bullion).....	<i>Short tons</i> 378,855	37,798	\$99.77
Secondary.....	254,960	24,334	95.44
Total, or average.....	633,815	62,132	98.20
Imports:			
For domestic consumption (Including lead entering into articles exported with draw-back on duty).....	11,308	\$ 726	\$ 64.20
For smelting, refining, and export.....	24,527	\$ 1,555	\$ 63.34
Total, or average.....	35,835	\$ 2,281	\$ 63.65
Exports:			
Withdrawals from bonded warehouses.....	24,527		
Refined lead in pigs and bars (domestic product).....	8,601		
Total.....	33,128		
Apparent consumption.....	636,522		
Ratio of imports for domestic consumption to the apparent consumption (percent).....	1.4		

¹ An average of 9,081 short tons of lead per year entered into articles exported during the period 1935-39 with draw-back of duty.

² Foreign value.

Somewhat over half the lead consumed in the United States is used in storage-battery plates, cable coverings, and building equipment (gutters, pipes, etc.). There is practically no substitution for the metal in these uses. Another considerable quantity, probably about

one-sixth, is used in pigments, where it encounters active competition from other materials, particularly zinc. The remaining one-third enters into a variety of other products, chief among which are ammunition, foil, solder, calking and bearing metals, and tetraethyl-lead gasoline.

Secondary recovery of lead is normally about 40 percent of the consumption of refined lead in pigs and bars.

Except for the period 1936-37 the United States has long been a net importer of lead; the excess of imports over exports prior to 1940, however, was very small. About three-fourths of the imports during the period 1935-39 entered duty-free under bond for smelting, refining, and export. The lead content of dutiable raw materials imported was, in most years, about equal to the lead content of exported manufactures (mainly batteries, cable, and lead pigments) upon which draw-back of duty was paid.

During the war the domestic consumption of lead has increased to unprecedented levels (1,126,000 short tons in 1943); the increase in imports (mostly imported by the Government duty-free) has been very much greater than that in domestic production, and for the first time a large proportion of the United States requirements of lead have been supplied by imports.

Practically all of the imports of lead, both before and during the war, have come from Mexico (the chief source), Canada, Newfoundland, and Peru. From about 1933 until 1941 imports were principally in the form of ore, bullion, and base bullion; imports of refined lead, scrap, and other forms were of minor importance during this period.

In general, the mining of lead ore has been under separate ownership and control from its treatment in smelters and refineries. The single exception has been in the operations of the American Smelting and Refining Company, which treats ores, concentrates, and bullion produced by Mexican subsidiaries of the company in smelters and refineries located in the United States. The treatment plants of this organization in the United States produced about three-fourths of the total refined lead output of the United States (from domestic and foreign ores) in the 4 years 1936-39, but a large proportion of the material treated originated at mines other than those owned by the company.

Except for 1936 and 1937, when the United States was a net exporter of lead (even without counting lead in articles exported with benefit of draw-back of the duty), the New York price of the metal has generally exceeded the London price by about 1½ cents per pound, or the amount of the tariff on lead in ores and matte. World production of lead has been rather sensitive to price change, and price increases have soon resulted in more metal being placed on the market; conversely, price declines have resulted in curtailing the supply.

It is probable that the maximum United States capacity for mine production of primary lead is somewhat less than 500,000 short tons a year. Depletion of ore bodies, declining grade of ore, and increased mining costs as development is carried further underground, all limit the production from known domestic sources. It is, of course, impossible to foresee possible discovery of new sources, but for a fairly long period in the past no major discoveries have been made. That price increases will not materially raise the maximum figure of

capacity has been evidenced by the experience with wartime premium price payments. Thus in 1942, with an average realized price of nearly 7 cents a pound (including premium payments), as compared with a market price of 5½ to 6 cents, the domestic industry produced only a little more than 450,000 short tons of primary lead. In 1943, with the realized price increased by 14 percent, to an average of more than 8 cents per pound, the production was less than in 1942, but this was largely due to manpower shortage rather than inadequate mine capacity. It is probable that in the long-term post-war period, domestic production from present known sources will not rise much, if any, above 450,000–500,000 tons. It is obvious that if important new discoveries are made, this estimate might be entirely too low. In an emergency it might be possible to increase the production from present known sources temporarily to more than 500,000 tons.

POST-WAR SHORT TERM

During the first few years after the war the great backlog of demand for automobiles and new construction will, in all probability, be reflected in demands for lead in the neighborhood of twice the 1935-39 average. Secondary recovery of lead will probably be well below the normal percentage of consumption, because of the loss of battle scrap which will not be available to the domestic industry. Imports many times larger than in the pre-war years will probably be needed to supplement primary domestic production.

POST-WAR LONG TERM

Consumption, Production, and Imports

The basic causal factor affecting the relation between production and imports in the post-war period will presumably be the fact, mentioned above, that unless unforeseeable new sources of supply are developed, the average annual output of domestic mines will probably not exceed 450,000–500,000 tons, even if the price of lead should be much higher than before the war. Secondary recovery is substantially proportional to consumption, being normally equal to about 40 percent of the quantity consumed. Whatever may be the excess of consumption over domestic production of primary and secondary metal must be made up by imports.

Per capita income at 1939 level.

Duty as in 1939.—The per capita consumption of lead would presumably be somewhat greater than before the war because of the general trend toward greater use of articles which contain lead, such as batteries. This factor together with the increase in population might result in an average consumption, with no change in duty, of about 750,000 short tons annually, as compared with the average of 637,000 tons in the pre-war period. About 300,000 tons would then be recovered from secondary sources, leaving the requirements for primary lead about 450,000 tons.

The price of lead in the United States would probably be about the same as during the pre-war period, or about \$100 per ton.¹ At this level domestic production of primary lead would probably be

¹ Many in the industry contend the price will be higher. If a higher price is assumed, estimates of post-war production and trade would have to be modified.

somewhat below maximum capacity, amounting to perhaps 425,000 tons, with a value of about 42.5 million dollars. Imports (not including material smelted or refined in bond, or material entering into articles exported with benefit of draw-back) might be of the order of 25,000 tons, with a foreign value (at about the average pre-war level of \$64 per ton) of around 1.6 million dollars.

Duty reduced by 50 percent.—Consumption of lead, at a given level of national income, is relatively inelastic. Nevertheless, changes in duty by as much as 50 percent might increase or decrease the price of lead enough to affect somewhat the amount consumed. A reduction of the duties by 50 percent might result in the consumption of as much as 775,000 tons, as compared with 750,000 tons with duties unchanged.

Such a reduction in duties would have a material effect on the ratio of imports to production. If, as a result, the price of lead in the United States (about \$100 per ton in the period 1935-39) should fall to about \$95 per ton, the working of certain domestic deposits and ores might become unprofitable. Hence the domestic mine production might be appreciably lower than with no change in duty, amounting perhaps to around 400,000 tons having a value of around 38 million dollars. The foreign producers would probably raise their prices somewhat as well as their share in the supply. Imports might become about 75,000 tons, or about 17 percent of consumption of primary lead with a foreign value of about \$70 per ton, amounting to about 5.25 million dollars.

Duty increased by 50 percent.—The domestic price of lead would presumably increase somewhat, perhaps to \$105 per ton. This might have some effect in reducing consumption, perhaps to around 725,000 tons, requiring around 425,000 tons of primary metal. The great bulk of this requirement would presumably be supplied by domestic mines, their output, at the price suggested above, being valued at about 45 million dollars. Imports, apart from material for reexports, would probably be very small.

Per capita income 75 percent higher than in 1939.

High per capita income favors large consumption of capital goods and of luxuries and semiluxuries. Demand for many products containing lead is, therefore, materially affected by the level of income. On this income assumption, the consumption of lead might be from 50 to 60 percent greater than with income at the 1939 level (estimated above at 750,000 tons). With the duty as in 1939, therefore, it might total 1.1-1.2 million tons annually, compared with an average of 637,000 tons in the pre-war period. Secondary recovery from scrap lead would presumably be around 450,000 tons annually, leaving the consumption of primary metal of the order of 650,000-750,000 tons. The strong demand for lead with high national income, particularly if it be assumed that income in other countries will also be at a high level, would, of course, tend to raise the price. With no change in duty, the domestic price might become from \$120 to \$130 per ton, as compared with about \$100 before the war. The stimulus to production would be so strong that, whatever be the level of the duty, domestic mines would probably be operated close to their maximum capacity, above estimated as from 450,000-500,000 tons annually.

Duty as in 1939.—Assuming primary production to be between 450,000 and 500,000 tons, its value, at the price level above mentioned, would be from 54 to 65 million dollars. Imports would supply the remainder of the consumption, or somewhere between 150,000 tons (based on minimum estimate of consumption minus maximum estimate of production) and 300,000 tons (maximum estimate of consumption minus minimum estimate of production), or 25–40 percent of primary consumption. The foreign unit value of imports would probably be about \$100 per ton.

Duty reduced by 50 percent.—Some reduction in price would presumably take place, which might increase the consumption 3 to 4 percent above the figure estimated on the basis of an unchanged rate of duty. Consumption thus might become 1,135,000–1,250,000 tons, including 685,000–800,000 tons of primary metal. With domestic production from 450,000–500,000 tons, imports would be within the range of 185,000–350,000 tons, or roughly 25–50 percent of primary consumption. Estimates of unit prices and total values of production and imports are given in table 2, the methods used being parallel to those already set forth.

Duty increased by 50 percent.—As the result of a slightly higher price, consumption of primary metal might fall to between 615,000 and 700,000 tons. Domestic production would still be at maximum capacity (say, 450,000 to 500,000) and imports would range between 115,000 and 250,000 tons, or 18 to 35 percent of consumption of primary lead.

Summary of estimates.

The foregoing estimates are summarized in tables 1 and 2.

TABLE 1.—*Lead: Estimated post-war consumption, imports, and production (primary) under the assumptions of Senate Resolution 341, in quantities*

[In thousands of tons]

Period, income level, and tariff treatment	Consumption			Imports		Production (primary) ¹
	Total	Secondary	Primary	Quantity	Percent of primary consumption	
1935-39.....	637	254	382	11	3	379
Post-war long term:						
Per capita income as in 1939:						
Duty as in 1939.....	750	300	450	25	6	425
Duty reduced by 50 percent.....	775	300	475	75	18	400
Duty increased by 50 percent.....	725	300	425	-----	-----	425
Per capita income 75 percent above 1939:						
Duty as in 1939.....	1,100-1,200	450	650-750	150-300	23-40	450-500
Duty reduced by 50 percent.....	1,135-1,250	450	685-800	185-350	27-44	450-500
Duty increased by 50 percent.....	1,065-1,150	450	615-700	115-250	19-36	450-500

¹ From domestic ores and base bullion.

TABLE 2.—Lead: Summary of estimated post-war production (primary) and imports for consumption under the assumptions of Senate Resolution 341, in quantities and values

Period, income level, and tariff treatment	Production (primary) ¹			Imports (for domestic consumption)		
	Quantity	Price per ton	Value	Quantity	Price per ton	Value
	1,000 tons		Million dollars	1,000 tons		Million dollars
1935-39.....	379	\$100	37.8	11.3	\$64	0.7
Post-war long term:						
Per capita income as in 1939:						
Duty as in 1939.....	425	100	42.5	25	64	1.60
Duty reduced by 50 percent.....	400	95	38.0	75	70	5.25
Duty increased by 50 percent.....	425	105	44.6			
Per capita income 75 percent higher than in 1939:						
Duty as in 1939.....	450-500	120-130	54.0-65.0	150-300	100	15.0-30.0
Duty reduced by 50 percent.....	450-500	115-125	51.7-62.5	185-350	105	19.4-36.7
Duty increased by 50 percent.....	450-500	125-135	56.7-67.5	115-250	95	10.9-23.7

¹ From domestic ores and base bullion. As to unit prices, see footnote 1, p. 451.

Exports

The exports of lead produced from domestic ore (though not reported separately from the general domestic exports of other lead) are known to be small, the maximum² volume being represented by the difference between total domestic exports of lead and the withdrawals of lead from bonded smelters and warehouses. During the period 1935-39 this difference averaged 8,601 short tons compared to a total domestic production of 633,815 short tons, or less than 1½ percent. In tables 1 and 2 the production estimates include no allowance for exports of lead of domestic mine origin. It seems improbable that the future export trade in domestically produced lead will exceed its insignificant pre-war volume, and it may readily cease altogether.

Employment

In 1939 about 8,000 persons were employed in the domestic lead mines and about 8,500 in lead smelters. The figure for employment in lead mining may include some workers engaged primarily in zinc mining, because of the association of the two metals in the ore. Employment does not vary proportionately with variations in the amount of lead smelted; under certain conditions, an increase of 10 percent in the number of workers would probably be sufficient to handle at least 50 percent more smelter production.

² The actual exports of lead produced from domestic ore may be somewhat less than this maximum because there is a limited exportation of lead metal derived from imported ore or bullion which has paid duty (instead of being treated in bonded smelters or warehouses) but which receives a draw-back of that duty when exported.

ZINC

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
393-----	Zinc-bearing ores (contained zinc)	1½¢ per lb.....	62%
	Zinc dross and zinc scrap (con- tained zinc)	1¼¢ per lb.....	43%
394-----	Zinc blocks, pigs, slabs, and dust	1¾¢ per lb.....	46%
	Zinc sheets	2¢ per lb.....	33%

NOTE.—The rates on the above commodities as fixed in the Tariff Act of 1930 were, respectively, 1½, 1¼, 1¾, and 2 cents per pound. The reduced rates of 1¼ cents on ores and 1¾ cents on blocks, pigs, etc., became effective January 1, 1939, pursuant to trade agreement with Canada. All the statutory rates were reduced 50 percent, effective January 30, 1943, pursuant to trade agreement with Mexico, the reductions to remain effective until 30 days after termination of the emergency, whereupon the rates in effect in 1939 will be restored. Zinc scrap was made duty-free for the duration of the emergency by Public Law 497, 77th Congress, effective March 14, 1943.

GENERAL

Data on United States production, imports, exports, and consumption for 1939 are given in the following table:

Item	Quantity ¹	Value	Unit value	
			Per ton	Cents per lb.
United States mine production.....	Short tons 583,877	\$1,000 \$ 60,716		
Recovered from old scrap.....	45,100	4,090		
Total production.....	628,977	64,806	\$104	5.2
Imports:				
For smelting and reexport (free in bond).....	9,217	324	33	1.6
For domestic consumption.....	64,885	3,233	50	2.5
Total imports.....	74,102	3,557	48	2.4
Exports:				
Withdrawals from bonded smelters.....	9,217	324		
Domestic exports ²	5,143	1,752		
Total exports.....	14,360	2,076	145	7.2
Apparent consumption.....	688,649	66,887	97	4.8
Ratio of imports for consumption to apparent consumption (percent).....	9			

¹ All quantity figures refer to metal content.
² Value estimated in terms of metal and does not represent value of ore at mine. Hereinafter value of domestic production is expressed in same manner.
³ Foreign value.
⁴ During 1939 draw-back was paid on 16,200 tons of zinc in manufactured articles upon exportation.
⁵ Unit value for this combination of classes has little meaning because of the great difference in the unit values of the individual products.

About 85 percent of all zinc ore goes to smelters for conversion to metal; the remaining 15 percent is used directly in the production of zinc oxide and other zinc chemicals. The metal is used largely in galvanizing, in alloying with copper to make brass, and in boiler plates, die castings, and various other metallurgical uses. United States consumption of zinc metal over a long period before the war increased at an average rate of about 5 percent per year, although in certain years it fluctuated widely, depending upon economic conditions. Consumption (including primary and secondary metal) ranged from about 300,000 tons (1932) to nearly 700,000 tons (1939). The 1935-38 annual average of approximately 600,000 tons seems more representative of pre-war consumption than the 689,000 tons consumed in 1939. During the period 1935-38 the average annual mine production in

the United States was 559,000 tons, and the average annual imports for domestic consumption, 19,600 tons.

The unit values of 1939 for domestic production and imports are a fairly satisfactory basis for estimating unit values in the post-war period. In that year the average unit value of the domestic mine production was 5.2 cents per pound, or \$104 per ton, while the average for the zinc content of imports (for domestic consumption) was \$50 per ton. This wide difference was due only in part to the duty and the costs of transportation. It resulted largely from the fact that the value for the domestic product is computed on the basis of the extracted metal including the cost of smelting and refining, whereas a large part of the imports entered in the form of ore or concentrates, the unit value of the metal contained being exclusive of the costs of smelting and refining.¹ It is likely that in the post-war period imports will also be largely in the form of ores and concentrates, and unit values of imports have been estimated on the assumption that the ratio of ores to extracted metal in the imports will be about the same as before the war. In recent years imports have come mainly from Mexico, Canada, and Peru. In addition, crude metal has been imported from Mexico, Canada, Belgium, and Poland.

The United States zinc-smelting capacity at present is much larger than the domestic mine capacity, as part of the smelting capacity was built to treat foreign concentrates. After 1935, because of a rising consumption and a decline in the grade of domestic ore, it became necessary, even before the war, to import increasing quantities of ore or concentrates. The war has accentuated the dependence of the United States upon foreign sources for part of its consumption of zinc-bearing raw material. Imports during the war, whether of ores or metal, have been largely brought in by Government agencies, free of duty.

The United States smelter capacity has increased in the war years by 35 percent (the major expansion occurring in Montana and Texas), and during this period 40 percent or more of the ores and concentrates treated by domestic smelters have been imported, notwithstanding a marked increase in domestic mine production. Imports previous to 1939 were largely ore entered free in bond for smelting, refining, and re-export, and crude metal on which draw-back of duty was paid on exports of products containing zinc. In 1939 and subsequent years imports for consumption became much larger. A substantial part of the imports has been material produced by American-controlled concerns.

Zinc ores in most foreign countries are much higher in zinc content than those in the United States. Before the war, the domestic price of zinc metal was approximately the world price plus the duty.

Domestic mine output has varied directly with the United States price of the refined metal. Cost of production varies widely from mine to mine; as prices go up, more mines come into production, and as prices go down, many mines become submarginal and cease to operate. In the past, with zinc at 4 cents per pound, mine production has been roughly 400,000 tons; at 5 cents, 550,000 tons; at 6 cents, 650,000 tons; at 7 cents, 700,000 tons; at 8 cents, 750,000

¹ In 1939, 21,000 tons of dutiable zinc were imported in the form of blocks, pigs or slabs, of which the foreign unit value was about \$64 per ton. About 23,500 tons (dutiable) entered in the form of ores, the average unit value of the zinc contained being somewhat less than \$40 per ton.

tons. In view of depletion of the higher grade ores in some areas, domestic production in the long-term post-war period may not be able to adjust itself so readily to changes in price.

POST-WAR SHORT TERM

Assuming national income to continue high, consumption of zinc is likely to be substantially above the average in 1935-38, because of the widespread use of zinc in civilian products for which there is a large backlog of demand, as well as exceptionally large requirements for repair work, replacements, and industrial rehabilitation. Primary production in the United States may continue at about the rate in 1939 (which was above the 1935-38 average) if the price is maintained at approximately present levels. Production, however, is likely to be considerably below the wartime figures. Imports for consumption will probably be two or three times greater than in 1939. The bulk of the imports will probably be in the form of ore.

POST-WAR LONG TERM

Consumption, Production, and Imports

In the following analysis it is intended to estimate, as closely as practicable, the imports of zinc, whether in the form of ore or of metal, for final consumption in the United States, and the domestic mine production of zinc, exclusive both of secondary zinc produced from scrap and of zinc smelted or refined from imported material. There may be in the future an even larger business than before the war in the importation of ores for treatment in bonded smelters, without payment of duty, and exportation of the resultant metal. This branch of the business is, of course, independent of changes in the rate of duty.

The basic assumption which underlies the estimates of domestic production and imports is that the long-time past trend toward depletion of deposits of zinc in the United States, particularly of low-cost deposits, will continue, and that domestic production may not hereafter be able to react as readily to increase in demand or advance in prices as it did before the war. If this assumption proves to be correct, the very large consumption of zinc under conditions of high national income would result in a great increase in imports and only a moderate increase in domestic production. On this assumption also, a 50-percent reduction of duty would tend materially to increase imports and to reduce production because the consequent lowering in price would make some of the domestic mines unprofitable; on the other hand, a 50-percent increase in duty would increase domestic production and lessen imports only within relatively narrow limits.

It is, of course, possible that fairly large new deposits of low-cost zinc may be discovered in the post-war period. In that case all the estimates hereinafter presented regarding production would be too low and those regarding imports too high.

Per capita income at 1939 level.

The per capita consumption of zinc in all forms might be about one-eighth greater than the pre-war average, as the result of growth of population and of some expansion in the use of the metal. Consumption, with no change in the rate of duty, might thus amount to

roughly 675,000 tons, of which about 60,000 tons would be secondary metal recovered from old scrap and about 615,000 tons would be primary metal. A 50 percent change in the duty in either direction would raise or lower prices considerably and might affect consumption by as much as 3 or 4 percent, or possibly even more.

Duty as in 1939.—Although it is probable that the price of zinc, even with no increase in national income, will be somewhat higher in the post-war period than before the war, domestic production of primary zinc may not be as great as before the war, for reasons already suggested. It may be 500,000–550,000 tons, compared with 559,000 tons in 1935–38, with a value of about \$120 per ton, or a total of 60–66 million dollars. On this assumption regarding production, imports (for consumption) might be 65,000–115,000 tons, which, at average unit values perhaps 20 percent higher than before the war, might have a foreign value of 3.9–6.9 million dollars.

Duty reduced by 50 percent.—This would presumably result in a domestic price about \$10 per ton lower than with the duty as in 1939. As a consequence, consumption might be 3 or 4 percent greater than with no change in duty, or possibly even more. The lower price would presumably make the operation of some United States mines unprofitable. Production of primary zinc might be about 10 percent less than with no change in duty, amounting to 450,000–500,000 tons, with a value of 49–55 million dollars. Imports would increase with the increase in consumption and the reduction in domestic production; they might amount to 140,000–190,000 tons. Presumably the foreign price of zinc would rise somewhat, so that the imports might have a value of 9–12 million dollars.

Duty increased by 50 percent.—The price in the United States would probably rise appreciably, perhaps to \$130 per ton. This would lessen consumption somewhat, stimulate domestic production to a degree, and reduce imports materially.—Domestic production of primary zinc might be 525,000–575,000 tons (about 5 percent more than with the duty as in 1939), with a value between 68–75 million dollars. Imports might be from 15,000–65,000 tons, which, at a unit value presumably somewhat lower than with no change in duty, might have a total foreign value of 0.8–3.6 million dollars.

Per capita income 75 percent higher than in 1939.

At a high income level the demand for both producer and consumer goods containing zinc would be strong. It is improbable, however, that the consumption would be affected as much as would that of most of the other metals, for the reason that it is more possible to economize in the use of zinc and to substitute other metals and non-metallic materials for it. Consumption might be about one-third greater than with income at the 1939 level, in which case, assuming the duty to be as in 1939, it would be around 900,000 tons annually, of which presumably about 820,000 tons would consist of primary metal. The consumption of primary metal might be about 25,000 tons greater if the duty were reduced by 50 percent and about 25,000 tons less if it were increased by 50 percent.

It is possible that domestic mines, with their limited reserves, could not increase their production in the same ratio as the increase in consumption, even though prices would probably be materially higher than with income as in 1939.

Duty as in 1939.—Under the stimulus of high prices, domestic production of primary zinc might be about 50,000 tons greater than

on the assumption of unchanged income; it might total 550,000-600,000 tons, which, at a price which might rise to as high as \$150 per ton, would have a value of 82.5-90 million dollars. A very considerable proportion of the large consumption would have to be met by imports, which might be from 220,000-270,000 tons and might have a unit value of around \$75 per ton, on which basis the total foreign value would be 16.5-20.2 million dollars.

Duty reduced or increased by 50 percent.—The changes in consumption, production, imports, and prices which would result from a reduction or an increase of 50 percent in the duty would be of the same nature as under the assumption of national income as in 1939.

Summary of estimates.

The foregoing estimates are summarized in tables 1 and 2.

TABLE 1.—Zinc: Estimated quantities of post-war consumption, mine production (for domestic market), and imports for consumption under the assumptions of Senate Resolution 341

(In thousands of short tons metal content)

Period, income level, and tariff treatment	Consumption			Mine production (for domestic market)	Imports (for consumption)
	Total	Secondary ¹	Primary		
1939.....	689	45	644	579	65
Post-war long term:					
Per capita income as in 1939:					
Duty as in 1939.....	575	60	615	500-550	65-115
Duty reduced by 50 percent.....	700	60	640	450-500	140-190
Duty increased by 50 percent.....	650	60	590	525-575	15-65
Per capita income 75 percent higher than in 1939:					
Duty as in 1939.....	900	80	820	550-600	220-270
Duty reduced by 50 percent.....	925	80	845	500-550	295-345
Duty increased by 50 percent.....	875	80	795	575-625	170-220

¹ Includes only secondary metal reclaimed from old scrap.

² The average consumption for 1935-38 was 600,000 tons and post-war estimates are based on that figure.

TABLE 2.—Zinc: Summary of estimated post-war mine production and imports for consumption under the assumptions of Senate Resolution 341, in quantities and values

Period, income level, and tariff treatment	Mine production				Imports for consumption			
	Quantity	Price		Value	Quantity	Price		Value ¹
		Per ton	Per pound			Per ton	Per pound	
1939.....	1,000 tons 584	\$104	Cents 5.2	Million dollars 60.7	1,000 tons 64.9	\$50	Cents 2.50	Million dollars 3.2
Post-war long term:								
Per capita income as in 1939:								
Duty as in 1939.....	500-550	120	6.0	60.0-66.0	65-115	60	3.00	3.9-6.9
Duty reduced by 50 percent.....	450-500	110	5.5	49.5-55.0	140-190	65	3.25	9.1-12.3
Duty increased by 50 percent.....	525-575	130	6.5	68.2-74.7	15-65	55	2.75	0.8-8.6
Per capita income 75 percent higher than in 1939:								
Duty as in 1939.....	550-600	150	7.5	82.5-90.0	220-270	75	3.75	16.5-20.2
Duty reduced by 50 percent.....	500-550	140	7.0	70.0-77.0	295-345	80	4.00	23.6-27.6
Duty increased by 50 percent.....	575-625	150	8.0	92.0-100.0	170-220	70	3.50	11.9-15.4

¹ Foreign value.

Exports

As already stated, the present report does not cover the business of smelting and refining foreign zinc ores and concentrates in bond with the exportation of the resultant product. There was before the war a rather small trade of this character and the quantities may be somewhat greater in the post-war period.

Before the war there was practically no exportation of ores and concentrates or of metal of domestic origin. Moreover, most of the exports of manufactures of zinc in more advanced forms (principally sheets and strips) were manufactured from imported metal on which there was a draw-back of duty. It is improbable that the United States will export domestic zinc ore or metal in appreciable quantities in the post-war period.

Employment

At its wartime peak the zinc industry of the United States had a total employment of about 25,000 (10,000 in mining and 15,000 in smelting). Figures for the pre-war period are not available but they may have been from one-fourth to one-third lower. If the preceding estimates regarding domestic production of zinc in the post-war period prove to be correct, the employment in the mines in this country will not be very different from the pre-war figure. It will be affected to some extent by changes in national income and in the rate of duty. If, however, imports for consumption in the post-war period are large, and if a large fraction of the imports enter in the form of ores and concentrates, the zinc-smelting industry of the United States may employ as many persons as in the pre-war period, or even perhaps considerably more.

MECHANICS' HAND TOOLS, N. S. P. F.

Tariff paragraph: 396.

Commodity: Mechanics' hand tools, n. s. p. f.

Rate of duty: 45% ad val.

NOTE.—The rate fixed in the Tariff Act of 1930 was 46 percent. It was increased to 65 percent on aluminum folding rules only, effective January 13, 1933, by Presidential proclamation under section 336 of the tariff act.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	44,030	3,003	41,027	1,255	41,255	Percent 0.6
Persons employed (number).....	7,000-8,000					

¹ Landed value; foreign value was \$176,000.

² Estimated.

This report covers a variety of hand tools such as axes, bits, braces, calipers, chisels, countersinks, gimlets, gouges, hammers, micrometers, planes, pipe tools, rules, screw drivers, vises, and wrenches.

The industries which manufacture these articles also produce other hand tools used by carpenters, farmers, garagemen, plumbers, and iron workers, which are covered by other tariff provisions.

Hand tools manufactured in the United States enjoy a high reputation for quality both in this country and abroad. This accounts for substantial exports in many of the classifications.

Imports of these tools in 1939 were exceptionally small. For example, imports amounted to \$380,000 landed value (\$238,000 foreign value) in 1937. Measuring tools were the predominant items imported in 1939, accounting for approximately two-thirds of the total value. In 1939, as well as in 1937, Germany supplied about two-thirds of the total value of all categories. Sweden was the next largest source. Previous to 1939, Japan shipped to the United States sundry low-quality tools.

Price may be a relatively unimportant factor in the selection of tools by skilled mechanics; they are inclined to buy tools made by well-known American concerns rather than foreign tools of less certain quality. On the other hand, it may be assumed that price is an important factor in regard to tools sold for occasional home and commercial use, although even here brand reputation has much influence. Accordingly, the effect of reductions or increases in the duty might be confined largely to the "utility" and the lower-quality articles. The imports of some high-grade tools produced from special steels might also be increased by a lowering of the duties—for example, certain alloy-steel tools made in Sweden.

POST-WAR SHORT TERM

Distribution of most kinds of mechanics' hand tools has been restricted during war years largely to those directly engaged in the war effort. This has resulted in an accumulated demand from other users. Production of these tools in the immediate post-war years may, therefore, be substantially greater than in 1939. Imports will probably be much smaller than before the war.

POST-WAR LONG TERM

Consumption, production, and imports

Per capita income at 1939 level.

Because of a level of construction activity considerably higher than in 1939 (even with no increase in per capita income), consumption of these tools may be 25 percent greater in value than in 1939 and may amount to about 50 million dollars; part of this increase in value may result from the use of better quality (higher priced) steel than was used in the 1930's in the production of many of these tools. This may apply particularly to edge tools, as well as to tools exposed to heavy duty or exceptional wear. It is likely also that a higher quality of metal will be employed in most imported tools.

Duty as in 1939.—Imports may account for nearly 1 percent of domestic consumption, or about \$450,000 landed value (\$300,000 foreign value). In that case, production for the domestic market would amount to about 49.5 million dollars. Because imports are so small a part of consumption, this same figure may be taken as the

approximate value whether the duty should be decreased or increased by 50 percent.

Duty reduced by 50 percent.—This may have considerable effect with respect to imports of precision measuring tools (micrometers, rules, bevels, and the like) as well as of some of the higher-priced edge tools. It might also cause an increase in imports of low-priced tools from Japan. Imports might be about 1½ percent of domestic consumption, or, say, \$800,000 landed value (\$500,000 foreign value).

Duty increased by 50 percent.—This would affect adversely importation of measuring and other tools of higher qualities, as well as of cheap Japanese tools. Imports might fall off to not much over one-half of 1 percent of domestic consumption, or say, to about \$300,000 landed value (\$200,000 foreign value.)

Per capita income 75 percent higher than in 1939.

At this higher level of income, which would cause a very large activity in construction, a substantial increase in demand for mechanics' hand tools, both foreign and domestic, would presumably occur, amounting to about 40 to 60 percent above the consumption at the 1939 income level. A substantial part of the increase may be the result of higher qualities, and partly because of an increase in prices for tools of a given grade. Domestic consumption might reach a value of approximately 75 million dollars. Production for the domestic market would be not much above or below 74 million dollars under any of three assumptions regarding the duty.

Duty as in 1939.—Imports might be about 1 percent of domestic consumption, or approximately \$750,000 landed value (\$500,000 foreign value).

Duty reduced by 50 percent.—Imports might be about 1½ percent of domestic consumption, or 1.1 million dollars landed value (\$700,000 foreign value).

Duty increased by 50 percent.—Imports might fall off to about three-fourths of 1 percent of domestic consumption, or about \$500,000 landed value (\$300,000 foreign value).

Exports

About 7 percent of the value of the United States production of these classifications of hand tools in 1939 was exported. Canada, the United Kingdom, Australia, Mexico, and Brazil were the leading markets. Probably the value of exports may amount to 4 million dollars in the long-term post-war period if per capita income is at the 1939 level, and may be 5.5 million dollars if the per capita income increases 75 percent.

Employment

These hand tools are to a large extent produced in industries which also manufacture other tools and associated articles. It is estimated that there may have been in 1939 around 7,500 workmen, most of whose time was engaged in the manufacture of the tools covered by this report. Probably 8,200 to 8,500 might be so employed in the post-war period if the per capita income of 1939 prevails, while 9,500 to 10,000 may be so engaged with an income level 75 percent above that of 1939.

SLIDE FASTENERS

Tariff paragraph: 397.
 Commodity: Metal zippers (slide fasteners).
 Rate of duty: 66% ad val.

NOTE.—The rate imposed by the Tariff Act of 1930 was 45 percent ad valorem, which was increased to 66 percent, effective July 31, 1936, by Presidential proclamation under section 336 of the tariff act.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (millions).....	500	32	532	Percent 10
Value (\$1,000).....	18,876	606		
Unit value (each).....	\$0.08	\$0.0218		
Persons employed (number).....	6,000-10,000			

¹ Exports not reported separately in official statistics, but known to be small.
² Estimated.
³ Foreign value; including free imports from the Philippines amounting to over 3.3 million fasteners, valued at \$108,000.

The United States is the leading producer and consumer of slide fasteners. Production increased steadily from about 25 million zippers in 1929 to approximately 500 million in 1941. Most of the fasteners were sold to manufacturers who incorporated them in articles which they produced. Probably not more than 5 percent were sold at retail.

In 1935 over half of the zippers sold in the United States (domestic and imported) were used on handbags, sweaters, and jackets. The rest were used on a wide variety of wearing apparel, billfolds, luggage, brief cases, and other articles.

The domestic producers met severe competition in the domestic market from foreign manufacturers during the first half of the 1930's. Certain types of fasteners and parts were then excluded from entry into the United States on the ground of patent infringement, and the rate of duty was increased about 50 percent by Presidential proclamation. However, imports continued to increase until 1938, when nearly 44 million zippers were imported, representing about 20 percent of total domestic consumption.

Japan has generally supplied 85 to 90 percent of the United States imports, but in 1935 and 1937 Czechoslovakia supplied 40 percent and 20 percent, respectively. Several other European countries and Canada have supplied significant quantities at times. The Japanese fasteners are considerably lower in price than those from other countries and have, in general, been lower in quality and less uniform in grade.

During the war, production of slide fasteners has been severely curtailed because of scarcity of materials; imports have been very small.

POST-WAR SHORT TERM

Consumption will probably be substantially higher than in 1939 because of increase in purchasing power, and because of a substantial backlog of consumer demand. Furthermore, new uses are constantly

being found for slide fasteners. The demand will be supplied chiefly by domestic manufacturers, imports probably supplying less than 10 percent.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption might amount to about 400 million fasteners annually or about 20 percent more than in 1939, by reason of increase both in population and in the number of ways in which zippers are used.

Changes in rates of duty would probably not have sufficient effect on consumption to warrant separate estimates. They might, however, affect materially the ratio of imports to domestic production.

Duty as in 1939.—If imports of fasteners continue to decline as before the war, they probably would supply not more than 5 percent of consumption, or about 20 million with a foreign value (at pre-war unit values) of about \$440,000. Domestic production in that case would amount to about 380 million fasteners, valued (at pre-war prices) at about 23 million dollars.

Duty reduced by 50 percent.—Imports would probably supply a substantially larger share of the market than in 1939, probably between 15 and 20 percent, or about 70 million. They might include a larger proportion of higher-priced fasteners than with an unchanged rate of duty, and have an average foreign unit value of about 3½ cents each; in that case the foreign value of imports would be about 2.5 million dollars. United States production would then total about 330 million zippers, valued at about 20 million dollars.

Duty increased by 50 percent.—Probably only about half as many fasteners would be imported as under the 1939 rate of duty, or about 10 million zippers, valued at about \$220,000. United States producers would supply about 390 million fasteners, valued at about 23.5 million dollars.

Per capita income 75 percent higher than in 1939.

Slide fasteners enter into many articles for which high income tends to increase demand greatly. Consumption might be about 50 percent higher than at the lower income level, or about 600 million zippers. Prices of the fasteners might be 10 to 15 percent higher than with income as in 1939.

Duty as in 1939.—The ratio of imports to consumption would probably be the same as under the lower income level, about 5 percent. Imports in that case would amount to about 30 million fasteners with a foreign value of about \$750,000. Domestic manufacturers would then supply around 570 million fasteners valued at about 38.5 million dollars.

Duty reduced by 50 percent.—As under the lower income level, imports would probably be much larger and include a larger proportion of higher priced fasteners than under the 1939 rate of duty. Imports might supply 15 to 20 percent of the total consumption, or, say, about 105 million fasteners with a foreign value of 4.2 million dollars. United States production would then amount to approximately 500 million fasteners, valued at about 33.5 million dollars.

Duty increased by 50 percent.—Imports would probably supply around 15 million zippers, or only about half as many as under the 1939 rate of duty, with a foreign value of about \$375,000. United States

production would then account for about 585 million, valued at roughly 39.5 million dollars.

Exports

Exports have been small and as foreign producers can undersell the United States producers in foreign markets, it is not likely that the United States will materially improve its position as an exporter.

Employment

The number of workers employed will probably rise, especially under the high income level, and might range between 10,000 and 15,000 persons.

SILVERWARE, STERLING¹

Tariff paragraph: 397.

Commodity: Sterling silver tableware (except cutlery) and silver manufactures, not specially provided for.

Rate of duty: 50% ad val.

NOTE.—The rate fixed in the Tariff Act of 1930 was 65 percent ad valorem, which was reduced to 60 percent effective January 1, 1939, pursuant to the trade agreement with the United Kingdom. The rate was further reduced to 32½ percent, effective January 30, 1943, pursuant to the trade agreement with Mexico, with reservation of the right to withdraw or modify the reduction after termination of the emergency.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	17,212	66	7,146	1,430	7,576	Percent
Persons employed.....	(²)					

¹ Sterling silver hollow ware, novelties, trophies, toiletware, and other articles; total production of sterling silverware including flatware (which includes cutlery) was valued at \$17,100,000.

² Landed value; foreign value was \$260,000.

³ Not available; employment in the sterling silver branch of the silverware industry is estimated at 3,000.

Modern sterling-silver tableware and silver manufactures dutiable under paragraph 397 include chiefly hollow ware such as tea sets, bowls, vases, and compotes. Similar silver articles made before 1830, which are duty-free, are the subject of a separate section in this report (antique silverware, par. 1811); silver knives and forks also are described in a separate section (cutlery, par. 355).

Except in hollow ware and novelties, domestic manufacturers of sterling silverware have little competition from foreign producers. A large part of the domestic output is utilitarian and consists of articles manufactured partly by mechanical means. Hand-wrought and ornamental articles also are produced to some extent.

Imports have come largely from Denmark and the United Kingdom. English ware has been valued highly because of the prestige of the British hallmark, and Danish silverware has been popular because

¹ Silverware of United States manufacture is invariably of sterling grade or 0.925 fine. This standard is also used by the major foreign participants in United States import trade.

of its unique design. Imported silverware generally sells at higher prices (duty-paid) than comparable types and grades of domestic ware.

Consumption of sterling-silver hollow ware, novelties, trophies, and the like is decidedly sensitive to fluctuations in national income and general business activity. Although consumption greatly decreased in the 1930's, compared with the 1920's, in 1939 it was slightly higher than the annual average for 1931-39.

During the war, little sterling-silver hollow ware has been made. Not only have many of the silverware manufacturers been engaged in the manufacture of war products, but the quantity of silver used by the industry has been limited to 50 percent of that used in 1941 or 1942, and most of the available silver has been used in the production of the more essential flatware. Manufacturers' and retailers' stocks of hollow ware have been greatly reduced. Imports from Denmark have ceased, and imports from the United Kingdom have declined greatly. Imports from Mexico have increased but they have been small in comparison with pre-war imports from the principal sources.

POST-WAR SHORT TERM

Domestic demand is likely to be considerably greater than in pre-war years. The value of the domestic output may be twice that of 1939. Manufacturers will require 6 months or a year to replenish both their own and the retailers' depleted stocks. Imports are likely to be small until foreign producers can resume operations for the export trade.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

On the basis of an increase in population, consumption may be about 10 percent more than in 1939. Production for the domestic market might be about 8 million dollars. Since imports in any case would be a relatively small fraction of consumption, changes in duty of 50 percent, although they might have a fairly marked effect on imports, would only moderately affect production and consumption, at this income level, and no separate estimates for them are shown under the various duty assumptions.

Duty as in 1939.—Imports, as formerly, would supply perhaps 6 percent of domestic consumption and have a landed value of \$500,000 (\$300,000 foreign value).

Duty reduced by 50 percent.—This would probably result in substantially increased imports not only from the United Kingdom and Denmark, but also from less important suppliers, such as Mexico. Imports might supply 8 percent of consumption and have a landed value of \$675,000 (\$500,000 foreign value), or about one-third more than with the duty as in 1939.

Duty increased by 50 percent.—Imports would probably have a landed value of about \$375,000 (\$200,000 foreign value), or about one-fourth less than with duty as in 1939. They would be likely to consist only of the higher priced specialties and to supply slightly less than 5 percent of domestic consumption.

Per capita income 75 percent higher than in 1939.

The demand for luxury goods, such as sterling-silver hollow ware and novelties, may be expected to increase markedly with a large increase in national income. Consumption might be 75 to 80 percent greater than with unchanged income and be about 15 million dollars, especially since unit values of silverware would be likely to reflect any increase in the general price level which might accompany a higher national income.

Duty as in 1939.—Because of the prestige of British and Danish silverware, it is probable that greater purchasing power in this country would increase somewhat the ratio of imports to domestic consumption. Should this ratio rise to about 7 percent, imports would have a landed value of perhaps 1.1 million dollars (0.7 million foreign value) annually, or twice as much as with income as in 1939; and the value of production for the domestic market would be about 13.9 million.

Duty reduced by 50 percent.—A strong potential demand for imported luxury ware doubtless exists; therefore demand would perhaps respond quickly to a reduction of 50 percent in duty. Imports might increase to as much as 1.4 million dollars landed value (1 million dollars foreign value) annually, or about 9 percent of domestic consumption. Production for the domestic market would probably be somewhat less than with the duty as in 1939, or about 13.8 million dollars.

Duty increased by 50 percent.—Imports would probably decline to about \$850,000 landed value (\$450,000 foreign value) annually. Imports at this level would supply about 6 percent of domestic consumption. Production would change but little.

Exports

United States exports of sterling-silver tableware and miscellaneous manufactures of silver have been comparatively small, and it is not probable that they will be materially larger after the war.

Employment

Employment in this branch of the silverware industry is small but includes some of the most highly skilled workers in industry. Years of training are required for workers to become sufficiently skilled to meet the requirements of manufacturers engaged in the production of the finest quality of silver articles, since many of these products are sold because of their artistry and on the reputation of the maker. With increased production, employment would rise proportionately and would require the training of new workers.

CHROME ORE OR CHROMITE

Tariff paragraph: 1647.
Commodity: Chrome ore or chromite.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production	Imports (ore)	Apparent consumption (ore)	Ratio of imports to consumption
Quantity (long tons).....	3,614	317,511	321,125	Percent 98
Value (\$1,000).....	47	13,815		
Unit value (per ton).....	\$13	\$43		
Persons employed (number).....	33			

¹ Foreign value.

The United States normally produces less than 1 percent of its requirements, as the domestic deposits are small and of low grade, unsatisfactory for most of the consuming industries. The principal sources of pre-war imports were Rhodesia, New Caledonia, Cuba, and South Africa. The variety of sources is different at least partly due to the differences in specifications of the ore demanded by manufacturers of alloys, refractories, and chemicals.

Consumption of chromite is governed largely by the volume of production of the steel industry, which absorbs from 70 to 80 percent of the entire supply in the form of metallurgical ore and refractories. The remainder is consumed by the chemical industry.

The Metals Reserve Co. has a stock on hand equivalent to about 30 months' normal consumption. Private industry has accumulated a like amount. Although production of domestic ore has been materially increased during the war, it has been largely of submetallurgical grade and has not been readily accepted by the steel industry. The major part of domestic production has been placed in stock piles. The cost of the domestic ore is relatively high, considering its poor quality, and it appears unlikely that production will continue on any significant scale in the post-war period.

POST-WAR SHORT TERM

On the assumption that the steel industry will be operating at about 10 percent below the present wartime peak,¹ consumption of chromite may be about 900,000 long tons. As in the past, the United States will import nearly all of its requirements. Imports may be received from the Soviet Union in addition to the former sources.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

With a 10-percent increase in population, steel production¹ and chemical manufacture may expand proportionately; this would require about 350,000 long tons of chromite, 98 percent of which would probably be imported. On the basis of 1939 price levels, such imports would probably have a foreign value of slightly more than 4 million dollars. Domestic production would probably not exceed 7,000 long tons, valued at about \$90,000.

¹ See section in this series on the steel industry.

Per capita income 75 percent higher than in 1939.

Taking account of a larger population, with greatly expanded national income, steel production should be nearly double that of 1939.² The demand of this industry, together with that of the chemical industry, would probably require about 600,000 long tons of chromite, nearly all of which would be imported. With a unit value somewhat higher by reason of an increase in the general price level, total (foreign) value of imports might approximate 8 million dollars. Domestic production would probably be little greater than at the lower level of national income and would be valued at about \$120,000.

Exports

It is not likely that domestic exports will reach significant proportions in the post-war period.

Employment

Pre-war employment in the chromite-mining industry was very small, and this is likely to be the case in the post-war period.

COKE

Tariff paragraph: 1650.

Commodity: Coke.

Rate of duty: \$2.24 per ton (import-exercise tax under Revenue Act). *Equivalent ad valorem (1939):* 33%.

NOTE.—The Revenue Act of 1932, effective June 21, 1932, imposed an import-exercise tax of 10 cents per 100 pounds on imported coke made from coal. Because of the conditional application of the tax and treaty obligations, this tax has been ineffective.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 long tons).....	39,584	527	39,057	127	39,184	Percent 0.3
Value (million dollars).....	212.9	3.9	209.0	1.4		
Unit value (per long ton).....	\$5.38	\$7.36	\$5.36	\$10.95		
Persons employed (number).....	24,060					

¹ Foreign value.

Restrictions placed by various governments on the publication of statistics in many of the major coke-producing countries have resulted in incomplete records since 1938. In that year United States production ranked second to that of Germany, being 32,496,000 long tons, or almost 22 percent of the world's output. Imports supply an insignificant proportion of domestic consumption and are of importance only for household use in a few localities (principally New England). Coke was imported chiefly from Canada, Belgium, the

² *Idem.*

United Kingdom, and Germany. The higher foreign unit value is explained partly by differences in grade and also by the fact that domestic coke prices in the areas into which imports enter are higher than the average price of total domestic production.

Since coke breaks up into dust or undesirable small pieces when handled too much, the best practice requires that it be used as near the place of production as possible. This factor tends to limit international trade in coke.

Of the total volume of coke manufactured in the United States, 66 percent is consumed by the producers, the rest being sold. Over 75 percent of the total production is consumed by the iron and steel industries, 17 percent in domestic heating, and the balance by foundries, nonferrous smelters, and miscellaneous industries. Consumption of coke in the future, therefore, as in the past, will be determined largely by the production of iron and steel.

POST-WAR SHORT TERM

On the assumption that during the short term domestic production of steel may be about 10 percent below the present wartime peak, coke consumption will probably be 60-65 million long tons. Imports will probably continue to be very small in comparison with consumption.

POST-WAR LONG TERM

Per capita income at 1939 level.

As estimated in the section on iron and steel,² the per capita consumption of iron and steel would probably be about the same as in 1939. The per capita consumption of coke for all purposes would probably show little change from 1939, but with the increase in population the total consumption might be 40-45 million long tons. If imports and exports showed corresponding changes, the imports would amount to 130,000-145,000 long tons, valued (at 1939 unit values) at 1.4-1.6 million dollars, and exports would amount to 535,000-600,000 long tons, valued at 3.9-4.4 million dollars. Domestic production would thus be a little more than the consumption, and would have a value, at 1939 prices, of 215-240 million dollars.

Per capita income 75 percent higher than in 1939.

Steel and other industries using coke as material would probably, under these circumstances, consume (taking into account increased population) 80-100 percent more coke than before the war. Although there would probably be a considerably lower percentage of increase in the relatively small consumption for domestic heating, consumption for all purposes might be between 70-80 million tons. Assuming similar changes in import and export trade, imports would be 225,000-250,000 tons, with a value (at unit prices perhaps 10-15 percent higher than in 1939) amounting to 2.8-3.1 million dollars; exports would amount to 950,000-1,050,000 tons, with a value of perhaps 7.9-8.7 million dollars. The domestic production, which would slightly exceed the consumption, might be valued at 400-500 million dollars.

² See section on iron and steel in this series.

Exports

In 1939 United States exports of coke went to many countries. Canada and France were the largest markets, the former alone taking 75 percent of the total. Canada's economic conditions tend to parallel those of the United States. Estimates of exports have already been presented.

Employment

Employment in 1939 amounted to 24,060 men, with a production per man of 1,650 long tons. It is estimated that our maximum labor requirements, on the basis of the long-run expansion which may result from high national income, will probably amount to 40,000-50,000 men, the approximate number employed during the war.

COAL

Tariff paragraph: 1650.

Commodity: Anthracite and bituminous coal.

Rate of duty: Free.

NOTE.—The Revenue Act of 1932, effective June 21, 1932, imposed an import-excise tax of 10¢ per 100 pounds on imported coal. Because of the conditional application of the tax and treaty obligations, this tax has been ineffective.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 long tons).....	303,495	12,000	291,495	823	304,317	Percent
Value (\$1,000).....	913,700	63,700	851,000	18,100		0.13
Unit value ¹						
Persons employed (number).....	24,060					

¹ Foreign value.

² There is such a spread in prices of anthracite and bituminous coal that unit values relating to both combined would have little meaning. The average mine value of bituminous coal produced in 1939 was about \$1.85 per long ton, and that of anthracite about \$3.00.

The foregoing figures of production include substantial but unknown quantities of coal produced and consumed by the same companies, which do not enter the open market.

The United States normally produces over 30 percent of the world's output of bituminous coal and over 50 percent of all anthracite. Of the 1939 domestic production of coal, 89 percent was bituminous and the remainder anthracite. Exports of both types of coal together amounted to 3.5 percent of domestic production, while imports supplied 0.13 percent of consumption. Imports came principally from Canada, the United Kingdom, and the Soviet Union. Most coal imports came into New England, but some came from Canada into other areas which are also deficient in coal.

The steel industry and the railroads consume over 25 percent of domestic production of bituminous coal, a large part coming from their own mines. No separate data are available on the production

of these "captive" mines. The trend in steel production and rail transportation in the post-war years will govern to a considerable degree the consumption of coal, particularly bituminous.

Estimates of post-war consumption of coal are necessarily rough approximations. It is certain, however, that, regardless of the level of national income or rates of duty, domestic production will depend essentially on domestic demand (plus the relatively small exports) and in only insignificant degree on the quantity of imports.

POST-WAR SHORT TERM

In the years immediately following the war, assuming high business activity, domestic consumption of coal may reach 550-600 million long tons, equivalent to an increase of 40-50 percent. This consumption would be one-tenth below 1944 peak war production. Imports may probably be less than before the war, owing to the disruption of the industry in Europe, but exports may be greater.

POST-WAR LONG TERM

Per capita income at 1939 level.

There would be little change from 1939 in per capita consumption, but with increased population, consumption of coal might be slightly above 410 million long tons, an increase of about 6 percent over 1939. Imports from the United Kingdom may decline unless the British mines improve their relative efficiency compared with the United States mines. This loss might be partially made up by increased imports from Canada and the Soviet Union. Total imports, however, would probably be less than in 1939, or about 425,000 tons, having a foreign value of about 2½ million dollars. Allowing for normal exports of 15 million tons, valued at about \$75,000,000, domestic production would probably be 425 million tons whose value would amount to about \$977,500,000.

Per capita income 75 percent higher than in 1939.

On the basis of an expanded national income and increased population, steel consumption would probably again reach the levels of 1943-44.¹ Transportation of goods would also increase because of expanded physical production. Consumption of coal in other manufacturing industries would probably follow the same course. That for household and related heating, however, would be little affected by income. Under these conditions, consumption might be slightly more than 700 million tons annually. Imports from Canada and the Soviet Union would probably increase and the total imports might reach 1 million tons, having a foreign value of about 7 million dollars. Exports might be about 25 million tons, valued at 140 million dollars. Domestic production would then be about 725 million tons, with a value perhaps double that in 1939.

Exports

United States exports have in the past gone to many countries, but principally to Canada (nearly 90 percent of the total in 1939), Cuba, Brazil, Argentina, and the Canal Zone. These will probably be the

¹ See section on iron and steel in this series.

leading markets for exports after the war. The coal industry in the United Kingdom will also export to those markets after the war, but improvement in efficiency in the British industry is essential before that country would be in a position to increase its exports greatly over pre-war levels.

Employment

The total number of men employed in the coal industry in 1939 was 488,000, whereas at present it is about 495,000. With the increasing mechanization underground, the present employment peak will probably not be reached again, even though post-war production achieves wartime levels.

COBALT ORE AND METAL¹

Tariff paragraph: 1652.
Commodity: Cobalt (ore and metal).
Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	¹ 2, 238
Value (\$1,000).....	² 2, 766
Unit value (per pound).....	\$1. 23

¹ Estimated cobalt content of ores mined plus imports of metal. Metal content of ores is not reported, and basis for the estimate was the value of imports at an assumed average unit value of 50 cents per pound of cobalt content, approximately the price for cobalt in ore in 1939.

² Foreign value.

Imports for 1939 were abnormally high. A more accurate basis for peacetime imports may be obtained by using the 5-year average 1935-39, as shown below:

Quantity (1,000 pounds).....	¹ 1, 200
Value (\$1,000).....	² 1, 420
Unit value (per pound).....	\$1. 19

¹ Estimated metal content of ore plus metal.

² Foreign value.

The largest single use of cobalt is in stellite (a cobalt-chromium-tungsten alloy used for high-speed cutting tools) and in stellite-type alloys, this use absorbing about 39 percent of the total cobalt consumed. Other important uses are in magnets, magnet steels, high-speed steels, and other tool-cutting materials, valve steel, welding rods, and carbide-type alloys. The United States is the world's largest consumer of cobalt, but domestic production is negligible. Under war conditions some domestic mines are being operated through Government subsidy, but they will probably be unable to compete in post-war markets. Import figures are taken to indicate domestic consumption in the pre-war period.

Radical changes have occurred in the sources of imports since 1939. Formerly imports consisted of refined metal from Belgium; and ore, concentrates, and metal from Canada. The invasion of Belgium in 1940 eliminated that source and depletion of ore reserves has relegated Canada to a position of minor importance. Major producing areas

¹ A separate section in this series has been prepared on cobalt oxide.

are now French Morocco, Belgian Congo, and Rhodesia. African production is a byproduct of copper mining, and the post-war production from this area would be governed by conditions in the copper industry. At the close of the war the United States will be in a position to refine most of the metal required, so that imports may enter chiefly in unrefined forms.

POST-WAR SHORT TERM

Should accumulated Government stocks of cobalt be sold on the domestic market, there would be little, if any, need for importation until stocks are liquidated, which might be from 1 to 3 years. Should accumulated stocks be withheld from the domestic market, the deferred demand for consumer goods into which cobalt enters might be large enough to require the importation of 2.0 million pounds annually with a foreign value of 2.5 million dollars.

POST-WAR LONG TERM

Consumption, Production, and Imports

There will probably be no domestic production, so that all requirements must be imported.

Per capita income at 1939 level.

By reason of increased population and the normal upward trend in the use of cobalt, consumption is likely to be 15-25 percent higher than during the 5-year period in the late 1930's, or perhaps 1.4-1.5 million pounds, with a foreign value of 1.8-1.9 million dollars, at about the average pre-war price.

Per capita income 75 percent higher than in 1939.

Cobalt requirements may be 75-100 percent greater than with income as in 1939, or 2.5-3 million pounds; with a unit value of perhaps \$1.40 per pound, the foreign value might be 3.5-4.0 million dollars.

COPPER

Tariff paragraph: 1658.

Commodity: Copper ores, concentrates, matte, blister, refined, and scrap.

Rate of duty: From Philippine Islands and Cuba, free; for smelting and refining in bond and export, free; other, 4¢ per pound on copper content.

Equivalent ad valorem (1939): See note.

NOTE.—The commodities covered by this report are free of duty under the Tariff Act of 1930. The rate of 4 cents per pound on copper content, shown above, is an import-excise tax imposed by the Revenue Act of 1932, effective June 21, 1932.

Equivalent ad valorem on dutiable imports were as follows: Concentrates, 44 percent; matte, 40 percent; blister, 47 percent; refined, 37 percent; and scrap, 45 percent. Effective March 14, 1942, copper scrap was exempted from this tax during the emergency, under Public Law 497, 77th Congress.

GENERAL

Data on United States production, exports, imports, and consumption for 1939 are given below:

Item	Quantity (copper content)	Value	Unit value
	<i>Short tons</i>	<i>\$1,000</i>	<i>Per short ton</i>
Production:			
Primary (from domestic ores, smelter basis).....	712, 875	\$ 148, 388	\$ 208
Secondary (old scrap, metal content basis).....	286, 900	\$ 59, 875	\$ 208
Total production	999, 775	\$ 208, 263	\$ 208
Imports:			
For smelting, refining, and export (bonded imports).....	214, 979	\$ 41, 864	\$ 193
For domestic consumption.....	\$ 15, 690	\$ 2, 691	\$ 171
Total imports	230, 669	\$ 44, 555	\$ 191
Exports:			
Withdrawals from bonded smelters.....	214, 979		
Refined copper in ingots, bars, and other forms (domestic product).....	\$ 157, 798		
Total exports	\$ 372, 777		
Estimated consumption	\$ 918, 967		
Ratio of imports for domestic consumption to total consumption (percent)	1.7		

¹ Estimated on basis of average price in 1939.
² Includes 7,238 tons (metal content) of ore, concentrates, etc., imported duty-free from the Philippine Islands and Cuba. Practically all of the remainder, 8,477 tons, which paid duty, entered into advanced products which were exported with draw-back of the duty.
³ Foreign value.
⁴ Consisting of domestically mined copper and small quantities of imported metal exported with benefit of draw-back while still in unmanufactured forms.
⁵ Total production plus imports minus exports plus 88,500 short tons withdrawn from stocks.

Copper is used principally in the manufacture of electrical equipment and wire, automobiles, building materials, and in a number of alloys, of which brass and bronze are the most common. Competitive materials have to a small extent displaced copper, but it is unlikely that this displacement will assume major proportions, because copper has useful properties (ductility, electrical conductivity, and corrosion-resistance) not possessed in equal degree by other substances in the same price range.

Before 1927 more than 50 percent of the primary copper produced in the world was extracted from ores mined in the United States. Immediately before the present war, only about 30 percent of the world's output originated in this country. Maximum peacetime output was reached in 1929 when about 1 million short tons were produced by United States mines. The 1929 average price was 18 cents per pound.

During the war, domestic output has been increased to about 1.1 million short tons annually (1943). About 75 percent of this copper has been produced under a price ceiling of 12 cents per pound, the remainder being subsidized by Government premium payments. This production has come largely from mines already in operation at the beginning of the war. Only one important new ore body has been developed, despite extensive exploration for new resources.

The enormous increase in the demand for copper during the war has to a large extent been met by a great expansion in imports, both of ores and unrefined metal and of refined copper. The greater part of the imports have been brought in by Government agencies free of duty. Exports, mainly to the United Nations, have also been abnormally large during the war.

United States imports, both before and during the war, whether for treatment in bond or for final consumption in this country, have originated chiefly in countries where United States interests operate important copper properties—Chile, Canada, Peru, and Mexico. Apart from these countries, the principal foreign production of copper is in Africa, where United States capital has relatively small holdings.

Before the war United States exports of copper, whether of domestic or foreign origin, went principally to Europe, but in the immediate pre-war years Japan took large quantities. Minor quantities were exported to Latin America. These same consuming areas also took the major part of the output of the other principal copper-producing countries in the pre-war period.

The duty (import tax) was first imposed in 1932. Before 1930 exports of copper exceeded imports. Imports at that time consisted chiefly of ores and unrefined copper for smelting and refining in this country, but there were also considerable imports of refined copper. Exports consisted chiefly of refined copper. During the years 1930–32 total imports somewhat exceeded total exports. The act imposing the duty on copper provided for free entry of ores, concentrates, and unrefined copper for smelting or refining in bonded manufacturing plants, the resultant product being exported. Imports for consumption in the United States from 1932 through 1939 were very small. Part of these imports were ores and concentrates imported free of duty from the Philippines and Cuba, under the special tariff regime applicable to those countries. The copper on which duty actually was paid, most of which entered in refined form, was practically all used in the manufacture of advanced products of various kinds, which were exported with benefit of draw-back of the duty on copper. In other words, there was in the pre-war period practically no importation of copper for permanent retention in this country, except small quantities from the Philippines and Cuba. In every year from 1933 through 1939, inclusive, total exports of copper, not including shapes and advanced manufactures, exceeded total imports, the excess representing the product of domestic mines.

The present report makes no attempt to forecast the post-war imports of copper free of duty, for treatment in bond, or the exports of refined copper derived from such imported material. This trade will probably continue to be large, and changes in the rate of duty will, of course, have no effect upon it. Moreover, no estimates have been made regarding the quantity of duty-free imports from Cuba and the Philippines; they are likely to be in the future, as in the past, a relatively small factor. The estimates of possible imports under different assumptions with respect to national income and rates of duty relate only to imports of dutiable copper for actual consumption in the United States.

The year 1939 was scarcely representative of pre-war conditions with respect to United States production of and trade in copper. Net exports of copper were exceptionally large because of the abnormal demand in countries preparing for war. The year 1937 was more nearly representative. Those data for 1937 which are particularly significant for forecasting the post-war situation were (in thousands of tons) as follows:

Production:	
Primary copper from domestic ores, smelter basis.....	835
Secondary copper.....	409
Total	1,244
Imports, other than for smelting and refining in bond:	
From Cuba and the Philippines (free).....	15
Dutiable (practically all obtaining benefit of draw-back) ..	15
Total	30
Excess of total exports over total imports, representing product of domestic mines exported.....	63
Consumption.....	1,094

¹ Taking account of increase of 57,000 tons in stocks.

POST-WAR SHORT TERM

Although, after peace comes, consumption of copper in the United States will decline sharply from the high war levels, it is likely, in view of high industrial activity and high buying power, to be much greater than in the average pre-war year. Consumption may be 1.2-1.3 million short tons, including both virgin and secondary copper; 800,000-900,000 tons of this quantity may be primary copper.

The domestic production during this period, as well as the dutiable imports (if any), will depend largely on the policy of the Government with respect to the large stocks which it has accumulated. If these stocks are held as reserves, the domestic production will presumably be considerably larger than before the war, though less than during war years; how much, if any, dutiable copper will be imported can scarcely be forecast.

POST-WAR LONG TERM

Consumption, production, and imports

Per capita income at 1939 level.

The per capita consumption of copper in the United States would probably be approximately the same as in the average pre-war year (the year 1939 was fairly representative as regards consumption). Taking account of the increase in population, total consumption of primary and secondary copper might total 0.9-1.0 million tons, depending somewhat on the rate of duty. The quantity of secondary metal available, would probably be somewhat greater than before the war, since the supply of scrap has been increasing. It may be estimated at 350,000 short tons, so that the consumption of virgin copper, on this assumption regarding income, might be 550,000-650,000 tons.

Estimates regarding imports of dutiable copper under the several assumptions with respect to rates of duty are necessarily uncertain, except that it appears improbable that there would be any such imports if the duty should be increased by 50 percent. Corporate relationships between United States copper-producing concerns and concerns in the principal foreign copper-producing countries, as well as cartel or other restrictive arrangements among producers, may exercise an important influence on imports in the post-war period, as they probably did in the pre-war period. If no cartel arrangements should exist and if domestic producers owning also copper mines in foreign countries should follow the policy of obtaining supplies from their

cheapest sources, then the major factors affecting imports would, of course, be differences in costs and other conditions of production in the United States and in the principal foreign producing countries, and the rate of duty.

During the pre-war years, after the imposition of the revenue tax, the tax was far from being fully effective. At no time was the excess of the New York price over the London price as much as 2 cents per pound, or one-half of the rate of duty; usually the difference was much smaller. It seems probable that the price policies of foreign and domestic producers, and of international cartels, were important factors in keeping the price differential down.

It is evident that if in the post-war period consumption should be no greater than before the war, and if conditions regarding prices, and regarding policies on the part of producers and cartels, should be similar to those in the pre-war period, dutiable imports (i. e., imports for actual consumption in the United States) would, as before the war, be negligible if the present duty should remain in effect, and that a reduction in the duty by 50 percent would be unlikely to result in any considerable quantities of imports. If, on the other hand, foreign producers should take full advantage of their probable low costs of production, and particularly if, as is possible, the costs of production in the United States should rise, because of depletion of low-cost deposits or other causes, small quantities of duty-paying copper might enter even at the present rate of duty, and there might be rather substantial imports if the duty were reduced to 2 cents per pound.

The estimates of imports of copper hereinafter presented are based on the assumptions that no large new low-cost reserves will be discovered in the United States, that the differences between foreign and domestic prices will be greater than in the pre-war period, and that, if price differences should warrant it, United States concerns would import copper from low-cost properties abroad rather than continue producing from their marginal mines in the United States. They are also based upon the assumption that a reduction in duty would tend to lower the price of copper in the United States and to increase the price in foreign countries, and that an increase in the duty would tend to raise the domestic price and to lower the foreign price. United States consumption is so large a fraction of world production that any change in conditions here would have an important repercussion on world prices. A change in the price of copper in this country, however, would not have a great effect on the quantities consumed here. In the following estimates, it is assumed that, on both assumptions regarding income (i. e., income as in 1939 and income 75 percent greater), the reduction in price resulting from a reduction of the duty by 50 percent, or the increase in price resulting from an increase in duty by 50 percent would affect consumption somewhat, but on account of the uncertainties involved the tops and bottoms of the ranges in the estimates have not been changed by uniform percentages to take account of these effects.

Duty as in 1939.—As already stated, the 4-cent duty virtually excluded imports of dutiable copper during the pre-war period. Assuming that with national income as in 1939, consumption of copper would be only moderately greater than before the war, a similar situation seems probable in the post-war period if the present duty is continued, even though domestic costs may rise somewhat owing to

the depletion of low-cost deposits. As already stated, however, conditions with respect both to foreign prices and the influence of intercorporate relationships and cartels might be such that small quantities of copper might enter even under these circumstances. Assuming that dutiable imports would be insignificant, the domestic production of primary metal for consumption in the United States would be 550,000–650,000 tons. The price would probably be somewhat higher than before the war, about 11 cents per pound (10½ cents in 1939), so that the value of production would be 121–143 million dollars.

Duty reduced by 50 percent.—The marked uncertainties with respect to the post-war conditions of competition in the international trade in copper, already discussed, make any estimate of imports of copper under a 50-percent reduction in duty very difficult. The most probable estimate as to the quantity of dutiable imports would seem to be 50,000–100,000 tons. It should be distinctly understood, however, that conditions might be such that imports would be lower or higher than these figures. With imports in the 50,000–100,000 ton range, and with consumption of primary copper perhaps in the 600,000–650,000 ton range, domestic production of primary copper might be 500,000–600,000 tons.

If, taking advantage of low foreign costs, the foreign unit value of imports should be somewhat lower than before the war, despite the reduced duty, or about 8 cents per pound (8.5 cents in 1939 for total imports of copper for consumption), the foreign value of 50,000–100,000 tons of imports would be 8–16 million dollars. In this situation the price of domestically produced copper might decline to 10 cents per pound, so that a production of 500,000–600,000 tons might have a value of 100–120 million dollars.

Duty increased by 50 percent.—It seems unlikely that with a duty of 6 cents per pound, there would be any dutiable imports for final consumption in the United States with national income as in 1939. The somewhat higher domestic price (about 11.5 cents per pound) might reduce consumption of primary copper to 550,000–600,000 tons. If domestic producers supplied the whole of this, the value of production for the domestic market would be 126–138 million dollars.

Per capita income 75 percent higher than in 1939.

During the 20 years preceding the war the consumption of copper varied quite closely with national income. This parallelism is due to the fact that, like other metals, copper enters into producers' capital goods and consumers' capital goods, a large proportion of the latter being above the rank of necessities. With this assumption regarding the level of national income, the consumption of primary and secondary copper in the post-war period might be about 75 percent greater than with income as in 1939; it might be 1,625,000–1,775,000 tons, depending in part on the rate of duty. The supply of secondary copper would not increase in proportion to the consumption; it might be about 400,000 tons, so that the consumption of primary copper might be 1,225,000–1,375,000 tons.

The most important point in connection with the estimates of production and imports, under this assumption regarding national income, is that, unless major new deposits of low-cost copper are discovered in this country, it is unlikely that domestic production could increase

at all proportionally to the increase in consumption. It is highly probable, to be sure, that with so great an increase in United States demand for copper (which, it is assumed, would be accompanied by large consumption in other countries), the price would be much higher than before the war. As against an estimated domestic price of about 11 cents per pound, given above on the basis of the assumption of national income as in 1939 and the duty as in 1939, the price might be of the order of 14.5 cents per pound. This high price might stimulate domestic production very considerably, but the greater part of the increase in requirements would still probably have to be supplied by imports. With no change in duty the foreign price might be of the order of 11 cents per pound.

Summary of estimates.

The estimates are summarized in tables 1 and 2.

TABLE 1.—Copper: Estimated quantities of consumption, imports, and production under the assumptions of Senate Resolution 341

[In thousands of short tons]

Period, income level, and tariff treatment	Consumption			Production for domestic market (primary)	Imports (duti-able)
	Total	Second-ary ¹	Primary		
Pre-war.....	915	267	713	713	Virtually nil.
Post-war long term:					
Income as in 1939:					
Duty as in 1939.....	900-1000	350	550-650	550-650	.....
Duty reduced by 50 percent.....	950-1000	350	600-650	600-600	50-100
Duty increased by 50 percent.....	900-950	350	550-600	550-600	.....
Per capita income 75 percent higher than in 1939:					
Duty as in 1939.....	1625-1775	400	1225-1375	800-1000	375-425
Duty reduced by 50 percent.....	1725-1775	400	1325-1375	750-850	575-575
Duty increased by 50 percent.....	1625-1675	400	1225-1275	875-975	300-350

¹ All consumption of secondary copper assumed to be produced in the United States.

TABLE 2.—Copp^{er}: Summary of estimated post-war production and imports under the assumptions of Senate Resolution 341, in quantities and values

Period, income level, and tariff treatment	Domestic primary production for domestic market			Imports		
	Quantity	Price per lb.	Value	Quantity	Foreign value per lb.	Value
	1,000 tons	Cents	Million dollars	1,000 tons	Cents	Million dollars
1939.....		10.4			8.5	
Post-war long term:						
Per capita income as in 1939:						
Duty as in 1939.....	550-650	11.0	121-143	.....	.....	.....
Duty reduced by 50 percent.....	500-600	10.0	100-120	50-100	8.0	8-16
Duty increased by 50 percent.....	550-600	11.5	126-138	.....	.....	.....
Per capita income 75 percent above 1939:						
Duty as in 1939.....	800-1000	14.5	232-296	375-425	11.0	82-63
Duty reduced by 50 percent.....	750-850	13.0	195-221	525-575	11.5	121-132
Duty increased by 50 percent.....	875-975	15.5	271-302	300-350	10.0	60-70

Exports

As already stated, the present report does not undertake to discuss the amount of copper, in the form of ores, concentrates, and unrefined metal, which may be imported into the United States in the post-war period for treatment in bond and exportation of the resultant refined metal. Consequently, it does not attempt to offer any estimate as to what the total exports of copper may be, including copper produced from imported material.

Whether there will be any exports of domestically-mined copper in the post-war period will depend presumably both on the level of national income, and the consequent demand for copper in this country, and on the rate of duty on imports for consumption in this country itself. If per capita income is the same as in 1939, it is possible that, as in most pre-war years, there will be a surplus of domestically mined copper available for export. The possibility of exports will, however, be affected by the policies of foreign producers and of any international cartel which may then exist. In any case, it seems improbable that the net exports would be as large as they were in several of the pre-war years.

Employment

According to the Census of 1939, the number of persons engaged in the copper-mining industry (wage earners and salaried employees) was 26,752. Besides these, a rather large number (not separately reported) were employed in smelting and refining copper, including the smelting and refining of considerable quantities of foreign ore and unrefined metal (mainly in bond for export of the resultant refined metal), and including the recovery of secondary metal.

It is probable that if national income in the post-war period should be at the 1939 level, and if there is no change in the rate of duty on copper, the number of persons employed in the copper-mining industry would be not materially different from the number in 1939. If a reduction of 50 percent in the duty should result in reducing the domestic production of copper (as estimated on page 479), the number of persons employed in the industry would decline, possibly more than proportionally because of the tendency to reduce, first, operations involving high labor costs.

With national income 75 percent higher than in 1939, and with probably decidedly higher prices for copper, the domestic mine production of copper (as estimated in table 1) might be around 50 percent greater than with income as in 1939, and result in the employment of 40,000 to 45,000 persons. This might result in a more than proportionate increase in the number of mine workers, because of the tendency to expand operations involving relatively high labor costs. The number employed under this income assumption would be somewhat less if the duty should be reduced by 50 percent than if it should remain as in 1939.

It is impossible to forecast what would be the number of persons employed in smelting and refining copper in the post-war period. It would undoubtedly be greater with national income at a high than at a low level. Workers in the smelters and refineries handle both domestic and foreign ores and unrefined metal, and a change in

the ratio of the domestic to the foreign materials handled may have little effect upon the total number employed. The effect of a reduction of duty would depend in part on the proportion of the imported copper which would enter in the form of ore, unrefined metal, and refined metal, respectively.

CORUNDUM ORE

Tariff paragraph: 1672.
Commodity: Corundum ore.
Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (long tons).....	1,754
Value (\$1,000).....	105
Unit value (per long ton).....	\$60

* Foreign value.

Corundum ore, a natural abrasive, is used principally in the manufacture of snagging wheels, which are large, coarse-grained grinding devices used by foundries for grinding off rough spots on malleable iron castings; and for grinding and polishing optical elements. No other abrasive has been found to be as efficient for these operations. Consumption of the ore has been rigidly controlled during the present emergency to direct it into these channels, which are essential to the prosecution of the war. For other operations, artificial abrasives have been successfully substituted for a number of years.

The consumption of corundum is governed principally by demand in the metalworking and optical industries. The United States produced some corundum during World War I and also during the current war. Normally it is dependent entirely on imports and takes more than 60 percent of the ore mined in South Africa, where practically the entire world supply is produced. The United Kingdom and Germany have been the principal markets for the balance of the South African production. After the war the United States will no doubt continue to depend upon imports for the bulk of its supply.

United States imports are erratic. In 1939 they were low, 1,754 tons, compared with an average of about 2,700 tons annually during the 7-year period 1934-40. After 1940 imports increased sharply because of war requirements. Import values per ton have varied considerably. The average foreign value in the 5-year period 1919-23 was \$90; from 1924-33, \$57; 1934-38, \$69; and 1939-41, \$58. After 1941 the value increased steadily.

POST-WAR SHORT TERM

Consumption and imports of corundum ore might possibly be more than double that of 1939, in view of the increase in population and the large backlog of deferred demand for automobiles and other consumers' durable goods.

POST-WAR LONG TERM

Consumption, Production, and Imports

The estimates which follow should be increased if the German optical industry is restricted after the termination of the war, in which case United States optical manufacturers might expand their production and thus increase the domestic demand for corundum.

Per capita income at 1939 level.

Consumption, and therefore imports, might total about 3,000 long tons, with a foreign value of approximately \$180,000. These estimates are based on average per capita consumption before 1941 (which was considerably higher than the 1939 level), on an estimated population of 144 million, and unit values about the same as in 1939.

Per capita income 75 percent higher than in 1939.

Consumption and imports might be about 4,000 tons, allowing for a general increase in industrial activity. The total foreign value of this tonnage might be about \$270,000, at prices 10 to 15 percent higher than in 1939.

Exports

Exports of corundum from the United States are in the form of manufactured abrasives, rather than in the form of ore, and this is likely to continue after the war because of the prestige of the United States products.

CRUDE ARTIFICIAL ABRASIVES

Tariff paragraph: 1672.

Commodity: Silicon carbide and aluminous oxide.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (short tons).....	18,000	63,364	171,364	Percent 89
Value (\$1,000).....		3,428		
Unit value (per short ton).....		\$54		

1 Estimated.
2 Foreign value.

Silicon carbide and aluminous oxide are the principal artificial abrasives. After crushing and grading, the abrasive material is used for coating paper and cloth, and is made into wheels and various other forms. It is also used, but in much smaller amounts, for refractories, nonskid flooring, and other nonabrasive purposes. Because of its greater hardness and brittleness, silicon carbide is better adapted than aluminous oxide for operations on very hard materials and on materials of low grinding resistance. Aluminous oxide, which is

tougher, is more adaptable for grinding materials of high tensile strength, and it is used in a greater variety of applications because its physical properties can be varied to a greater extent. Both abrasives have replaced corundum and other natural abrasives in many fields because they are harder and because their quality can be more easily controlled.

The United States is the principal consumer of artificial abrasives. Consumption probably increased about 10 percent in the 5-year period 1935-39 as compared with the 5-year period 1925-29. Since 1941, owing to war-production activity, average annual consumption probably has been 150 percent greater than before the war.

Most of the abrasive material consumed in this country is from United States-owned plants in Canada, where they were established to take advantage of low electric-power rates. These abrasives are produced in electric furnaces, and electric power constitutes one of the major manufacturing costs. The bulk of the Canadian as well as domestic production is in the Niagara Falls area. The Canadian output is usually shipped in crude form to the United States, where it is crushed and graded before further processing.

Separate statistics are not available for United States production, but it is known that domestic output supplies about 10 percent of consumption. Imports fluctuate with general business activity and averaged about 75,000 tons annually during the 5-year period 1935-39. This average is higher than imports in 1939 because it reflects the large volume imported in 1937.

POST-WAR SHORT TERM

As domestic demand for artificial abrasives depends largely upon industrial activity, particularly in the metalworking industry, rather than on price, it might be assumed that consumption of artificial abrasives might follow closely the output of crude steel, which is a reliable index of industrial activity. It is assumed, therefore, that the consumption, production, and imports of these abrasives might be from 40 to 50 percent over 1939 levels, the percentage increase being the same as that estimated for crude steel in this period.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Assuming that the demand for abrasives might follow closely the demand for crude steel, and that a somewhat greater amount of crude steel might be used than in 1939, the consumption of crude artificial abrasives will probably be about 80,000 tons. Of this amount, 72,000 tons might come from Canada, with an approximate foreign value of 3.9 million dollars, and about 8,000 tons might be produced domestically.

Per capita income 75 percent higher than in 1939.

Based on an estimated increase in the output of steel of 70 to 80 percent over 1939, consumption of artificial abrasives might approximate 125,000 tons, probably about 90 percent of which would come from Canada, or about 110,000 tons, with a foreign value of about 6.5 million dollars, assuming that prices will increase 10 to 15 percent over 1939. On that basis domestic production would be about 15,000 tons.

PLATINUM AND ALLIED METALS

Tariff paragraph	Commodity	Rate of duty
1699	Iridium, osmium, palladium, rhodium, and ruthenium, and native combinations thereof with each other and with platinum.	Free.
1734	Ores of the platinum metals.	Free.
1744	Platinum, unmanufactured or in ingots, bars, sheets, or plates not less than 1/8 inch in thickness, sponge or scrap.	Free.

GENERAL

Data on United States production, exports, imports, and apparent consumption for 1939 are given below:

Item	Production		Exports ¹	Imports	Apparent consumption	Ratio of imports to consumption
	Primary	Secondary				
Quantity (troy ounces).....	22,400	63,443	76,129	266,627	323,300	Percent 98
Value (\$1,000).....	\$ 1,040	\$ 2,000	\$ 2,400	\$ 9,882		
Unit value (per troy ounce).....				\$32.30		

¹ Including an estimated 28,800 ounces of crude Alaskan platinum valued at an estimated \$920,000, the export of which was not separately reported.
² Estimated.
³ Foreign value.

Because 1939 was a year in which imports, exports, domestic production, and apparent consumption were abnormally high, average data for the period 1935-39 are given below for comparison:

Item	Production		Exports ¹	Imports	Apparent consumption	Ratio of imports to consumption
	Primary	Secondary				
Quantity (troy ounces).....	20,610	65,046	60,651	209,868	234,873	Percent 89
Value (\$1,000).....	\$ 660	\$ 2,000	\$ 2,000	\$ 8,378		
Unit value (per troy ounce).....				\$30.39		
Persons employed ⁴						

¹ Including an estimated 90 percent of the Alaskan production of crude platinum which was sent to the United Kingdom for refining but not separately reported in the export statistics.
² Estimated.
³ Foreign value.
⁴ The employment in the mining of platinum was about 100 persons. The employment in the refining of platinum is not known but is estimated at about the same number.

Platinum and the platinum-group metals (osmium, palladium, iridium, ruthenium, and rutherfordium) are used primarily in the chemical and electrical industries, in dentistry, and in the manufacture of jewelry. They are, generically speaking, silver-white metals characterized by easy workability, resistance to tarnishing and corrosion, and good electrical conductivity. Although their largest single use is in jewelry, about 65 percent of the consumption is divided among various applications in dental, chemical, and electrical equipment.

Platinum (here used to refer to both platinum metal and to the rest of the metals of the so-called platinum group) has a very high unit value compared to most other metals. Because the cost of transportation is minor as compared to the unit value, the metal moves freely in

international trade. Tariff barriers are virtually nonexistent and the direction of the international trade is largely the result of the historical development of the business.

Substantial quantities of refined platinum are produced in the United States. This country has also produced a considerable volume of crude platinum, mainly in Alaska. Before the war, however, little of the domestic crude was refined in this country. Trade connections developed before the war resulted in the shipment of the largest part of the domestic crude platinum (that originating in the Goodnews Bay mining district of Alaska) to the United Kingdom for refining. In addition to these exports of domestically produced crude platinum, there was a considerable export trade in refined metal.

The United States has been on a substantial net import basis with respect to both crude and refined platinum. The imports in all forms have usually exceeded exports by about 145,000 ounces and have accounted for 85 to 95 percent of the apparent consumption, including the large consumption of secondary metal. Imports have been in the form of crude metal from Colombia and the Union of South Africa for domestic refining, as well as in the form of refined metal and scrap from the United Kingdom.

As a result of the war, domestic refining capacity has been expanded to treat the Alaskan and a portion of the Canadian production which was formerly shipped to the United Kingdom for refining. It is probable that the greater part of these wartime shifts in the refining trade will be retained after the war; this development will have the effect of decreasing both imports and exports of platinum by about 30,000 ounces a year, but will have no influence on the country's net import position.

The applications of platinum are such that consumption in jewelry and in expansion of industrial plant equipment is accelerated when national income is high and industry active; conversely, consumption declines markedly when income and industrial activity are low.

The prices of platinum and its allied metals have not fluctuated greatly during the past 10 or 15 years and, in view of this stability, major price changes are not anticipated in the future. The value of production, not directly available in the statistics, is estimated in terms of an average price of \$32 per troy ounce.

POST-WAR SHORT TERM

Consumption of platinum may increase somewhat (about 10 percent) over the pre-war average level, from the impact of the improvements in industrial technology which have taken place during the war. Domestic production of crude platinum probably cannot be increased considerably unless new sources of the metal are discovered. It is likely that the domestic refiners will continue the wartime practice of treating the Alaskan crude ores. This will have the effect of tending to reduce to some extent the amount of imports of refined metal. If Government-held stocks of platinum should be thrown on the market, this would tend to decrease further the volume of imports of refined metals, which also may be restricted somewhat by an indeterminate demand in Europe for industrial reconstruction.

Consumption, Production, and Imports

Domestic production of crude platinum (mainly in Alaska) will probably remain at the pre-war level of approximately 35,000 ounces per year, regardless of changes in national income, and will probably continue to be refined chiefly in the United States, as during the war period. The great bulk of the domestic supply of platinum undoubtedly will, as before the war, be imported as refined metal and as sponge and scrap for domestic refining. Secondary production, an important factor, is a more or less constant proportion of consumption, about one-fourth.

Per capita income at 1939 level.

Consumption of platinum and the platinum-group metals may be about 275,000 troy ounces. Domestic primary and secondary production may supply about 40 percent of the consumption, or about 105,000 ounces. Production for the domestic market may have an estimated value of 3.1 million dollars. Imports may thus amount to about 170,000 ounces, having a foreign value of about 5.5 million dollars (unit value, \$32 per troy ounce).

Per capita income 75 percent higher than in 1939.

It may be that consumption will be in the neighborhood of 500,000 troy ounces, or about 80 percent greater than at the lower income level. About 30 percent of this demand may be supplied by domestic primary and secondary production of about 160,000 ounces, with an estimated value of 5.1 million dollars, and the rest, perhaps about 340,000 troy ounces, may be imported. The foreign value of the imports may be in the range of 10-12.5 million dollars (unit value \$29-\$38 per troy ounce).

Exports

The post-war exports of platinum are expected to be somewhat less than those of the immediate pre-war period. The portion of domestic crude production which was exported for refining in the United Kingdom will probably be refined in the United States. Increased consumption in this country may absorb all of the metal derived from the Alaskan crude, as well as some which was formerly exported after being domestically refined from imported crude material.

Employment

The employment in mining (about 100 persons in 1939) is not likely to vary unless important new sources are discovered. Employment in refining and processing is likely to increase to some extent but the total employment under any probable expansion in the industry may not exceed 300 persons, inclusive of those in mining, refining, and treatment.

IRON ORE

Tariff paragraph: 1700.
Commodity: Iron ore.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 short tons).....	57,940	1,184	56,756	2,702	59,458	Percent 4.5
Value (\$1,000).....	¹ 150,677	3,578	147,099	² 5,866		
Unit value (per ton).....	\$2.60	\$3.02	\$2.59	\$2.17		
Persons employed (number).....	20,137					

¹ Approximate value at mine as reported by U. S. Bureau of the Census.

² Foreign value.

Iron ore is the basic ferrous material for the manufacture of pig iron. The United States has large reserves of iron ore, although it is becoming necessary to utilize more of the low-grade ores as the reserves of high-grade ores are rapidly being exhausted. For many years about 85 percent of the output has come from the Lake Superior district, where the high-grade deposits may be exhausted in about 10 years at present production rates. The reserves of low-grade ores should last for hundreds of years.

Iron ore has been on the free list since 1913. Chiefly because of the advantage of low-cost water transportation, a small part of United States pre-war consumption was imported, for use largely by plants along the Atlantic seaboard. Most of the imports came from Chile, Cuba, and Sweden. Practically all of the exports have gone to Canada, where they enter free of duty.

POST-WAR SHORT TERM

Consumption, production, imports, and exports seem likely to be substantially above the 1939 levels, because of the huge backlog of demand for iron and steel and the assumed high income level. Consumption of iron ore may, however, be somewhat lower in relation to crude steel production than during the war, because scrap, for which substantial amounts of iron ore have had to be substituted because of limited scrap supplies, may again be more plentiful.

Assuming that adequate shipping facilities will be available, imports of iron ore may exceed 1939 levels by a considerable margin. Plants utilizing imported ore have been greatly expanded during the war and may operate at a high rate in the immediate post-war years, producing iron and steel for domestic and export markets.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The consumption of iron ore (expressed in terms of the same iron content as before the war) may be in the range of 65-70 million tons, or from 10-20 percent above the level of 1939. Apart from growth of population, changing habits tending to increase per capita consumption of iron and steel seem likely to be a major factor.

Because of the further depletion and increasing cost of domestic ores, imports may supply 5-6 percent of consumption, compared with 4.5 percent in 1939. Imports may be 3-4 million tons, with a foreign value of 7.5-10 million dollars; the unit value is taken as \$2.50 a ton, compared with \$2.17 in 1939, largely because a greater part of the imports may consist of higher grade ores than in 1939. Thus, imports may increase from about 10-50 percent above the 1939 level in quantity and 30-70 percent in value (foreign). Domestic production of iron ore for the domestic market (expressed in terms of ore of the same iron content as before the war) may be 61-67 million tons, with a value (at prices somewhat higher than before the war because of resort to less accessible and lower grade ores) of 175-190 million dollars (\$2.86 per ton, or about 10 percent higher than in 1939).

Per capita income 75 percent higher than in 1939.

Under these conditions, the consumption of iron ore may be from about 50-60 percent greater than with income as in 1939, ranging from about 100-110 million tons (expressed in terms of ore of the same grade as before the war). Large tonnages will be required to support a crude-steel production which may equal or even exceed maximum wartime levels. (In 1942 the apparent consumption of iron ore amounted to 116 million tons and crude-steel output to 86 million tons. In 1944 crude-steel output reached nearly 90 million tons.) It seems likely that supplies of scrap, which in the manufacture of steel may be substituted within certain limits for pig iron, will be more plentiful than during the war. If this proves to be the case, less iron ore would be consumed for an equivalent steel production than during the war.

Because of the still greater depletion and still higher cost of domestic ores which would result from large domestic production, imports may supply from about 6-7 percent of consumption, or 6-7 million tons, valued at 15-18 million dollars. Production for the domestic market (in terms of ore of pre-war grade) would then be 93-104 million tons with a value, at, say, \$3 per ton, of 280-310 million dollars.

Exports

It is probable that practically all our exports of iron ore will continue to go to Canada, where they enter free of duty. The large iron and steel plants in Ontario may still be heavily dependent upon iron ore from the Lake Superior district of the United States. Some new mines have been opened in Canada during the war, but they may be able to supply only a small part of the consumption of these inland plants. Transportation costs to inland Canadian blast furnaces from foreign countries other than the United States probably would be prohibitive.

United States export trade in iron ore may depend more on income levels in Canada than on any other factor. National income is likely to show the same trends in Canada as in the United States. Under favorable conditions, exports may exceed the level of 1939, especially when due consideration is given to the fact that the Canadian iron and steel industry has been substantially expanded during the war.

Employment

About 20,000 persons were employed in the iron-ore industry in 1939. Despite increased mechanization, the number of workers per ton of ore shipped seems likely to increase in the long run because of the depletion of high-grade direct shipping ores. In the Lake Superior district, about 5 or 6 times as many workers will be required to produce concentrates from low-grade taconite as are required to produce an equivalent amount of high-grade open-pit ores. It is likely, however, that the transition from low-grade to high-grade ores will be spread over a long period so that the increase in employment will be gradual and, in the period being considered, employment is unlikely to be greatly affected by this factor. Therefore, the number of workers will probably vary about in proportion to the volume of output.

TANTALITE AND COLUMBITE

Tariff paragraph: 1719.

Commodity: Tantalite and columbite (ores of tantalum and columbium).

Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	166
Value (\$1,000).....	120
Unit value (per pound).....	\$0.78

¹ Foreign value.

Imports in 1939 were abnormally low. A more accurate measure of peacetime production and imports is provided by an average of the 5 years 1935-39, as shown below:

Item	Domestic production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds).....	12	801	813	Percent 90
Value (\$1,000).....	73	² 254		
Unit value (per pound).....	\$0.88	\$0.82		

¹ No exports reported.

² Foreign value.

Tantalite and columbite usually occur together as mixtures, and the ore is classified for statistical purposes according to the element which predominates. Columbium is used almost entirely in the manufacture of stainless steel. One-third of the tantalum consumed is used in the

form of metal in electronic tubes for radar equipment, one-third in compounds for catalysts in synthetic rubber production, and one-third in alloys for cutting tools and surgical instruments. The commercial use of these metals is a comparatively recent development and dates back only to the late 1930's.

The United States is the world's largest consumer of these metals and domestic production has been and is likely to continue negligible. Both tantalite and columbite are rare minerals and, during the war, production has been at capacity in Nigeria, Belgian Congo, and Brazil, the only important sources of imports before and during the war.

POST-WAR SHORT TERM

Consumption might be slightly greater than in the late 1930's and might total 0.9-1.0 million pounds. Imports might be very small or substantial, depending upon the policy followed in disposing of the large Government stock piles which will exist after the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption, which will probably be supplied almost wholly by imports, might approximate that of the late 1930's, and might total 800,000-900,000 pounds, with a foreign value of \$600,000-\$700,000.

Per capita income 75 percent higher than in 1939.

Consumption and imports might be 50 percent greater than in the late 1930's, or 1.2-1.3 million pounds, with a foreign value of 1.1-1.2 million dollars, allowing for some increase in foreign prices.

VANADIUM ORE

Tariff paragraph: 1719.

Commodity: Vanadium ores and concentrates.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds vanadium content).....	1,084	2,084	4,078	Percent 51
Value (\$1,000).....	1,992	1,992		
Unit value (per pound of contained vanadium).....	\$ 80.50	\$ 80.47		
Persons employed (number).....	500-600			

¹ Unit value has been estimated from the quoted price of vanadium oxide. Vanadium oxide contains 86 percent vanadium; therefore, with a market price of 37.5 cents per pound of oxide, a pound of metal would be worth about 50 cents.

² Foreign value.

The figures for 1939 were abnormally high. A more representative picture of pre-war production, consumption, and imports may be obtained from the statistics for the 5-year average 1934-38, which

have been used as a basis for the post-war estimates and which appear below:

Item	Production	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds vanadium content)-----	580	942	1,522	<i>Percent</i> 62
Value (\$1,000)-----	1 290	1 375		
Unit value (per pound of contained vanadium)-----	1 \$0.50	1 \$0.40		

1 Estimated on basis of unit value for vanadium oxide.

2 Foreign value.

Vanadium is used principally for making fine-grained alloy steel and iron. It is used both as a deoxidizing agent and for benefits which residual vanadium confers upon steel. The United States is the world's leading consumer of vanadium and Peru is the outstanding producer. Most of the production in the United States and in Peru is controlled by one United States company. Between 1939 and 1944 imports remained at 1939 levels, while domestic production was quadrupled to meet expanded war requirements, principally by exploiting low-grade ores and by recovering vanadium as a byproduct from complex iron ores. A large part of the increased output is produced at a high cost and probably will not be continued after the war. Post-war domestic production will probably be below the 1939 level, which was much higher than other pre-war years.

Imports have generally provided about one-half to two-thirds of the United States vanadium requirements and are likely to continue to supply a major part of our consumption.

About 95 percent of the vanadium consumed in the United States goes into the manufacture of alloy iron and steel, principally in high-speed steels. Alloy steels containing from 2 to 5 percent of vanadium are considered preferable. Because of the greatly expanded production of alloy steels during the war, for which even the increased supply of vanadium from domestic sources was inadequate, wartime vanadium-steel alloys have generally been made with about 1 percent of vanadium. It may be expected that after the war high-vanadium steels will again be made, and that the pre-war relation of vanadium consumption to the total production of steel (about 0.056 pound per ton of steel) will be reestablished.

POST-WAR SHORT TERM

In the immediate post-war period the production of steel will probably be 75-80 million tons.¹ On this basis, consumption of vanadium would probably be 4.0-4.5 million pounds, of which 2.5-3.0 million pounds might be imported.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level:

Production of steel in the United States would probably approximate that of 1939, or would be 55-60 million tons.¹ Under these conditions domestic consumption of vanadium might be 3.0-3.5

¹ See section on iron and steel in this series.

million pounds, of which domestic production would probably not exceed 1 million, with a value at 1939 prices, of about 5 million dollars, and imports would probably be 2.0-2.5 million pounds valued at \$950,000 to \$1,200,000 (foreign value).

Per capita income 75 percent higher than in 1939.

Domestic production of steel might amount to 80-90 million tons,¹ indicating an average annual consumption of vanadium of 4.5-5 million pounds, of which 3.5-4 million pounds valued at 1.8-2.1 million dollars might be imported, and about 1 million pounds produced in the United States, with a value of perhaps \$570,000. In estimating the values, a price increase of 10-15 percent has been allowed to conform to an assumed general increase in price levels.

Exports

In view of the paucity of vanadium deposits, the United States is not likely to export any domestically produced metal after the war.

Employment

At the estimated rate of domestic production during the long-term post-war period, about 400-500 workers are likely to be employed in the mining and processing of vanadium.

ILMENITE

Tariff paragraph: 1719.

Commodity: Ilmenite (including ilmenite sand).

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (short tons).....	14,602	286,876	301,178	<i>Percent</i> 95
Value (\$1,000).....	118	² 1,125		
Unit value.....	\$8.10	\$3.93		

¹ None exported.

² Foreign value.

Ilmenite, a natural oxide of titanium and iron, is valued principally for its content of titanium oxide. Approximately 93 percent of domestic consumption is in the manufacture of pigments for paint, varnish, lacquer, paper, linoleum, rubber, coated textiles, leather, printing ink, soap, and cosmetics. The manufacture of alloys and miscellaneous products consumes the remainder.

Before 1942 the United States depended principally upon imports of ilmenite to fill domestic requirements, the principal sources being British India, Ceylon, and Australia. Since that year, owing to greatly expanded production in this country, the major part of requirements has been filled by domestic ilmenite, the 1943 imports being

¹ See section on iron and steel in this series.

only 26 percent as great as in 1939. It is expected by the trade that the United States will soon be practically self-sufficient in this mineral, and that the domestic product can compete effectively with duty-free imports.

The Government stock pile of ilmenite on January 1, 1945, was sufficient to supply approximately 9 months' wartime consumption.

POST-WAR SHORT TERM

The civilian and industrial deferred demand for titanium oxide, mainly in the form of pigments, may result in a volume of consumption only slightly less than during the war and much greater than in 1939. On the basis of the increasing production of the domestic industry, little if any ilmenite will probably be imported.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Allowing for the increase in population, domestic consumption of ilmenite may be about 330,000 short tons, or about 10 percent more than in 1939. Domestic production would probably be around 300,000 short tons valued, at the pre-war price, at about 2.4 million dollars whereas imports may run 30,000 short tons, having a foreign value of about \$120,000.

Per capita income 75 percent higher than in 1939.

Following the general business trend, consumption of ilmenite may be about 40 percent greater than with the lower income level, or, about 475,000 short tons. Domestic production might supply as much as 75 percent of this amount, or 355,000 short tons, valued at 3.2 million dollars. Imports would then be 120,000 short tons, having a foreign value of about \$530,000.

Exports

Exports of ilmenite in 1939 were negligible, and it is unlikely that they will be significant in the post-war period.

Employment

The number of persons employed before the war in mining and milling ilmenite cannot be statistically segregated from those engaged in associated operations. If domestic production develops to the point of supplying total consumption, employment will be probably 10 times greater than before the war.

NEEDLES ¹

Tariff paragraph: 1724.

Commodity: Needles, hand sewing or darning.

Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

¹ In addition to hand-sewing needles classified herein, small quantities are imported in needle cases or books (par. 343).

Quantity (1,000 needles)-----	724, 000
Value (\$1,000)-----	1 539
Unit value (per thousand)-----	\$0. 75

¹Foreign value.

Hand-sewing needles have never been produced in the United States on a commercial basis. They are imported in a variety of sizes and grades designed for particular uses, such as ordinary hand-sewing needles and darning needles, and trade needles used by tailors, milliners, glove makers, bookbinders, and upholsterers.

Needles differ greatly in quality. Those of superior quality are well pointed, smooth-eyed (usually gold plated), and do not bend or break easily. English needles and needles from the Netherlands have constituted the higher-priced group among imports, while those of German, Czechoslovak, and Japanese manufacture have supplied a lower-priced demand.

In 1939 the United Kingdom supplied 53 percent of the total quantity and 79 percent of the total value of United States imports; Germany and Japan each supplied about 22 percent of the quantity and 9 percent of the value.

During the war, American requirements are being supplied almost entirely by British manufacturers. Wartime requirements for needles used in sewing airplane fabric have increased substantially. The average unit value of imports from the United Kingdom rose from \$1.12 per thousand in 1939 to \$1.70 per thousand in 1942, but declined somewhat in 1943.

POST-WAR SHORT TERM

The demand for hand-sewing needles for use in the home is relatively inelastic and the household expenditure for such articles is trivial. Demand is only slightly more elastic in the trades. On account of larger population, consumption (and hence imports) in the first 2 or 3 years after the war will probably be about 5 percent greater than in 1939, or about 760 million needles a year. The unit value of imports will probably be greater than in 1939 because of the preponderance of high-grade British needles in imports; hence the total foreign value may be about 0.8-1.0 million dollars.

POST-WAR LONG TERM

Essentially the same factors affecting consumption and imports apply to the long term as to the short term. Changes in national income will probably have little effect on the quantity of hand-sewing needles used, the more important factor being the increase in population, which may result in imports of 750-850 million needles.

Per capita income at 1939 level.

Assuming the average price of 1939 to prevail, the slightly increased imports would be valued at \$560,000-\$650,000.

Per capita income 75 percent higher than in 1939.

Increase in per capita income of this magnitude may be accompanied by an increase in the general price level, over 1939, of perhaps 15 percent, and the foreign prices of needles will probably follow the general price trend. If sources of imports are approximately the

same as before the war, the average unit value of imports may be 10-15 percent higher than before the war and the total imports may have a foreign value of \$650,000 to \$800,000.

SELENIUM

Tariff paragraph: 1758.
Commodity: Selenium.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Domestic production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds).....	227,100	124,830	352,000	<i>Percent</i> 35.5
Value (\$1,000).....	397	² 193	590	.....
Unit value (per pound).....	\$1.75	\$1.55	\$1.67	.....
Persons employed (number).....	50-100	.....	.....	.....

¹ No exports shipped.

² Foreign value.

All selenium of commerce is a byproduct of the copper industry. Anode sludges from the electrolytic refining of copper are processed and the selenium content recovered. United States plant capacity has been increased to approximately 750,000 pounds per year (during the war), but output is limited by the amount of sludges available. Some of the production of selenium in the United States comes from blister copper imported for refining.¹ The United States is the world's largest consumer of selenium. Imports are largely from Canada. The largest market is the glass industry, where it is used as a red colorant and, in lesser amounts, to neutralize the light green color caused by iron oxides. The metal is also used in light-sensitive cells for fire detectors, burglar alarms, and other products of a similar character; in the rubber-goods or artificial-rubber industry for reducing the length of the curing period, and increasing the tensile strength of the rubber; in the stainless-steel industry for increasing the machinability of the metal; and in red-paint pigments containing cadmium and barium. At present domestic stocks are equivalent to about one year's supply. This is the normal situation of the industry, and, therefore, the problem of disposal of surplus stocks does not exist. The United States has now the capacity to supply all metal required for domestic consumption as far as selenium sludge is available, but it is possible that imports from Canada will continue, since Canada will have a surplus resulting from the refining of copper produced in that country. The sole Canadian producer is advantageously situated with respect to United States consuming industries.

POST-WAR SHORT TERM

The selenium industry will not be confronted either with the problem of accumulated stocks or of competition from secondary metal or substitutes. A strong demand for selenium will result from

¹ See the report on copper in this series.

heavy construction (especially housing, in which more glass will be used than formerly), and an increasing use of devices which incorporate selenium cells. It is likely that these industrial activities will obtain full development shortly after the close of the war. The limiting factor in the use of selenium is the amount of electrolytic copper treated and the selenium content thereof. Factors similar to those causing a strong demand for selenium will presumably cause a strong demand for copper, and the quantity refined in this country (including foreign crude metal) may be sufficient to provide all the selenium required. Domestic production might be 400,000–500,000 pounds, valued at \$700,000–\$900,000. However, imports from Canada are likely to continue.

POST-WAR LONG TERM

Consumption, Production, and Imports

Consumption of glass in which selenium is used may be about 40 percent greater than in 1939 at the 1939 income level, and about 100 percent greater at the high income level.² As the glass industry is the principal consumer of selenium, these assumptions have been used in preparing the following estimates.

Per capita income at 1939 level.

Domestic requirements of selenium may be 500,000 pounds. Because of the great increase in domestic production capacity during the war, the proportion of consumption supplied by imports would probably be considerably smaller than in 1939. Imports might be 50,000 pounds, with a foreign value of \$80,000 (\$1.55 per pound). Production for the domestic market would then be 450,000 pounds, with a value, at 1939 prices, of about \$800,000.

Per capita income 75 percent higher than in 1939.

With the demand for glass assumed to be 100 percent greater than during 1939, domestic requirements of selenium may be 750,000 pounds. Domestic production may be 650,000 pounds, with a value of about 1.3 million dollars, and imports 100,000 pounds with a foreign value of \$175,000 (\$1.75 per pound). In estimating unit values, allowance has been made for an increase of 10 to 15 percent to conform to the assumed general increase in price levels.

Exports

As in the past, exports in the post-war period are likely to be insignificant or none.

Employment

As selenium is a byproduct of the copper industry, employment in the post-war period might be about 50 persons with national income as in 1939 and about 100 persons on the high-income assumption.

² See section on glass and glassware under schedule 2.

TIN: ORE, OXIDE, AND METAL

Tariff para- graph	Commodity	Rate of duty
1785.....	Tin ore and oxide.....	Free.
1786.....	Tin in bars, blocks, pigs, etc.....	Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production secondary tin	Exports	Imports ¹ (primary tin)	Apparent consump- tion	Ratio of imports to con- sumption
Quantity (long tons).....	26,000	0	68,500	94,500	Percent ² 100
Value (\$1,000).....	22,280	0	68,500		
Unit value (per ton).....	\$856		\$1,000		

¹ Exclusive of reexports of 2,105 long tons valued at \$2,648,342.

² Of primary metal.

³ Foreign value.

The United States has never been a substantial producer of tin ore. In 1939 production amounted to only 34 long tons tin content and was essentially a byproduct of gold dredging, principally in Alaska. Extensive surveys conducted by the United States Geological Survey and the Bureau of Mines have failed to locate promising ore bodies. The United States, the world's largest consumer, must therefore rely almost entirely upon imports of virgin tin, ore, and oxide. Malaya and Great Britain are the principal sources of imports.

Before the present war, export taxes imposed on tin ore from British colonies destined to countries other than British territory precluded shipment to this country of high-grade ore. Consequently Bolivia remained our only source of the ore. However, these Bolivian ores are low-grade and require sweetening with high-grade ore. Deprived of high-grade material, tin smelting in the United States was compelled to close in 1924. Not until the opening in 1942 of the new Government smelter in Texas was the industry revived. The future position of the new smelter is uncertain. It began by importing ore from Bolivia only after an agreement had been reached with England, which normally contracts for Bolivia's entire output. After the cessation of hostilities, the greater part of this ore may again go to the United Kingdom.

An international cartel has been in existence since 1931 for the control of production and prices. Known as the International Tin Committee, it represents about 90 percent of the world output. The Committee sets production quotas for each country and establishes prices that have remained stable even during the war years. If this control is discontinued, it might be possible to obtain sufficient Malayan and Bolivian concentrates to enable the smelter in Texas to operate on an economical basis.

In 1939 about 40 percent of the domestic consumption of tin was in the manufacture of tin plate. Other important uses are in solder, which varies largely with tin-plate production and in bronze and other copper-base alloys, which follow the trend of steel production rather closely. In 1939 the consumption of tin, primary and secondary, was

1.6 pounds per capita. Beginning about 1937 the amount of tin used by the tin-plate industry per ton of steel has been declining because of the use of a thinner coating. The old procedure of coating steel plate by the hot-dip method required 1.5 pounds of tin per base box (i.e. 100 pounds of tin plate). Under the new electrolytic process only 0.5 pound is required per base box, and some tin plate has even been made that contains as low as 0.25 pound or 0.10 pound per base box. To date, however, electrolytic-deposited tin plate is used only in dry-pack canning. Wet-processed food must await additional research, now under way, for the development of electrolytic tin plate of high corrosion resistance. Even so, in 1944 electrolytic tin plate constituted about one-fourth of the total produced, and its use is estimated to have conserved about 10 million pounds of tin.

Other trends which tend to reduce the consumption of tin are the use of lacquers to protect the metal in steel cans and the use of glass containers to replace tin cans. Although these methods of conserving tin have been necessitated by war conditions, and in fact largely prescribed by governmental orders, they may nevertheless persist in considerable measure during peacetime. Still other wartime economies in the use of tin are less likely to persist in the future; these include the replacement of tinfoil by aluminum, lead, cellophane and wax paper, and the replacement of tin by aluminum in collapsible tubes. Some solders using silver as a base during the war are likely to displace permanently small quantities of tin. The expansion of the frozen-food industry has also tended to reduce the requirements for tin plate containers; this trend will undoubtedly continue.

POST-WAR SHORT TERM

Because of the severe restrictions placed upon the use of tin by the War Production Board, the consumption of the metal in 1943 was 15 percent less than in 1939. With the removal of these restrictions, the high national income in the immediate post-war period, together with pent-up demand, are likely to cause a consumption considerably greater than before the war, notwithstanding the tin-conserving practices described above. Consumption of primary tin may amount to from 90,000 to 105,000 long tons. This quantity of tin must be imported, whether it be in the form of metal or of concentrates for the Texas smelter. There will probably be some delay in satisfying the demand, since the mines and smelters in the principal producing countries of southeast Asia may need a year or more for rehabilitation.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The increase in population would tend to add to the consumption of canned goods, but the effect upon the consumption of tin plate would probably be offset, or even more than offset, by the changes in methods of making tin plate and in methods of conserving foods, which have already been described. The consumption of tin in other uses would probably increase proportionally to population growth. The total consumption of tin, primary and secondary, might be greater than the 95,000 tons consumed in 1939, say, 100,000 tons. About three-fourths of the consumption will be primary tin, which will have to be imported. Imports thus would probably be about 75,000 tons,

with a foreign value, at the pre-war level, of about \$1,000 per ton. If imports should be mainly in the form of ore, the foreign value might be 15-20 percent lower. Domestic production of secondary tin would be 25,000 long tons, valued at about \$21,400,000.

Per capita income 75 percent higher than in 1939.

High per capita income does not tend to increase the consumption of canned goods (it rather tends in the opposite direction), and in view of the trends mentioned above, consumption of tin for this purpose might be no greater than in 1939, or even somewhat less. The quantity of tin used in bronze and other copper-base alloys and for most other purposes, however, tends to increase, along with that of steel, when business activity is high. Combining the effects of these factors, per capita consumption of tin (primary and secondary), which was 1.6 pounds in 1939, would probably be 1.8-2.1 pounds, resulting in a total consumption (primary and secondary) of 130,000 long tons. Such a consumption would require imports of 100,000 tons of virgin tin. Assuming foreign prices to be about 15 percent higher than in 1939, the value of these imports would be in the range of 105-125 million dollars, provided imports consisted chiefly of the metal itself. Should they be mainly in the form of ore, the foreign value would be 15-20 percent less. Domestic production of 30,000 long tons of secondary tin would be valued at about 29 million dollars.

Exports

As in the past, little or no pig or bar tin will be exported.

Employment

The Texas smelter employs about 600 persons. Production at present is approximately 30,000 tons, although its rated capacity is reported to be between 70,000 and 90,000 tons. If sufficient concentrates should be available to operate the smelter near the rated capacity, employment may reach 700 persons. If, however, the smelter be permanently closed after the war, there will remain only the small number of persons employed in the recovery of secondary metal.

TIN PLATE SCRAP

Tariff paragraph: 1786.
Commodity: Tin plate scrap.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (long tons).....	1 235,630	25,800	309,740	12,633	322,370	Percent
Value (\$1,000).....	1 5,024	1,121	.....	1 128	.....	.....
Unit value (per ton).....	\$16.00	\$43.32	.....	\$10.00	.....	.....
Persons employed (number).....	1 700	.....	.....	.....	.....	.....

¹ Estimated.

² Foreign value.

Tin plate scrap is the waste product resulting from the fabrication of tin plate into finished articles such as cans, bottle caps, and stampings. The United States tin can industry, which furnishes by far the largest production of scrap, consists of more than 75 plants scattered in at least 24 States. The scrap metal is pressed into bundles and shipped to the nearest detinning plants.

The domestic detinning industry (seven plants in 1939) had sufficient capacity to handle about 350,000 tons of scrap annually, whereas production in normal times is said to have been about 275,000 tons. In the past, Japan has been by far the largest market and has paid prices so high that the domestic detinning industry petitioned the President for issuance of an executive order against exportation of tin plate scrap. The export licensing bill, subsequently passed by Congress in 1939, included exports of tin plate scrap. In 1939 all licenses issued (172) named Japan as the country of destination. In 1943 the Government built a detinning plant in Birmingham, Ala., for the treatment of reclaimed tin cans. Production, however, did not begin until 1944.

No statistics are available on the production of tin plate scrap, but trade reports indicate the scrap amounts to approximately 15 percent of total tin plate production which in 1939 amounted to 2,237,535 long tons.

Imports of tin plate scrap have always been small and came principally from can plants in Canada. Exports formerly moved to 16 or more countries, the major portion to Japan, China, Hong Kong, and the Netherlands.

Tin plate made by the hot-dip process formerly required 1.5 pounds of tin per base box of 100 pounds of tin plate. Since 1937, the amount of tin used by the tin plate industry per ton of steel has been declining because of the use of a thinner coating even by the hot-dip process. Under the new electrolytic process only 0.5 pound of tin is required per base box; whereas some tin plate has been made that contains only 0.25 pound and in some instances as little as 0.10 pound per base box.

Domestic production of tin plate scrap depends chiefly upon the domestic production of tin plate, principally that going into food containers.

The following estimates of scrap production are based upon the past relationships between total steel output, tin plate output, and scrap recovery. When tin again becomes available in adequate quantity, it is assumed that future average use will be about 1 pound per box of tin plate, which means that the average value of scrap tin plate will be much lower than formerly. It is further assumed in the following estimates that all can-plant scrap is returned for detinning.

POST-WAR SHORT TERM

With the removal of wartime restrictions on the use of tin, it is anticipated that much more tin plate scrap will be produced than in 1939 but, because of its lower tin content, the value of the scrap may be no larger than in 1939. Imports may reach 14,000 long tons, having a foreign value of about \$140,000.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

With the rate of steel production at a level of 55-60 million tons a year, production of tin plate may be about 2½ million long tons. Processing of this plate should result in the production of approximately 415,000 long tons of scrap, or about 24 percent more than in 1939. The value of this output at a price of perhaps \$10 per ton, because of reduced tin content, would be around 4.1 million dollars. Production for the domestic market would probably be around 380,000 long tons, with a value of 3.8 million dollars. Imports will probably depend largely on the rate at which tin plate is consumed in manufacturing in Canada and Cuba, the most important sources of United States imports. If consumption in those countries increases at about the same rate that is expected in the United States, enough scrap should be produced to permit United States imports to rise to about 16,000 long tons a year. Since unit values of imports also will probably be less because of the reduced tin content, total foreign value of imports may approximate \$105,000.

Per capita income 75 percent higher than in 1939.

The steel industry may produce about 3.6 million long tons of tin plate for the domestic market, the fabrication of which would yield approximately 540,000 long tons of scrap, or about 30 percent more than with income as in 1939. Assuming a similar increase in scrap production in Canada and Cuba, United States imports of scrap may be about 22,000 long tons. Adjusting the value of production and imports for the decreased tin content on the one hand and for a moderate increase in the general price level on the other hand, the total foreign value of imports may be about \$155,000. Production for the domestic market would probably be about 500,000 long tons valued at about 5.7 million dollars.

Exports

Exports of tin-plate scrap are difficult to predict because they fluctuated considerably before the war, and in 1939 some importing countries, particularly Japan, were probably building up war stocks of tin. If, however, they were to approximate the same ratio to domestic production as in 1939, total exports would be about 33,000 long tons under the lower-income assumption and about 43,000 under the higher-income assumption, with values of \$330,000 and \$515,000, respectively.

SILVERWARE, ANTIQUE'

Tariff paragraph: 1811.

Commodity: Silverware produced before 1830.

Rate of duty: Free.

GENERAL

In 1939 United States imports (apparent consumption) amounted to \$720,000 (foreign value). This amount was somewhat below the pre-war annual average of \$859,000 for the period 1937-39.

The United States is an important market for antique silverware. Some consumers prefer antique ware to modern ware, even at a higher

price. Not all imports of antique silverware are distributed through commercial channels, some being sold directly to museums or private collectors. Retailers' mark-ups on antique ware vary according to the condition of particular articles, their design and history, and the price at which they were acquired. Consideration is also given to prevailing prices of similar modern ware.

The United Kingdom is by far the principal source of United States imports; other sources include France and the Netherlands.

Imports consist chiefly of sterling silver hollow ware but also include Sheffield plate produced by welding sheet silver to a sheet or bar of copper. Most Sheffield plate, like antique sterling, has considerable prestige value.

Imports compete to a certain extent with modern sterling and silver-plated hollow ware, domestic production of which had a total value of about 15 million dollars in 1939.

POST-WAR SHORT TERM

The volume of imports to be anticipated immediately after the war is unpredictable. Although it seems doubtful that there will be any substantial increase compared with 1939, it is possible that many European owners of antique silverware may wish to sell their holdings in order to purchase more essential goods, in which case imports might exceed substantially the pre-war level.

POST-WAR LONG TERM

Per capita income at 1939 level.

Imports (and consumption) might be 0.8-1.0 million dollars (foreign value) annually, or somewhat more than the average for 1937-39.

Per capita income 75 percent higher than in 1939.

Imports (and consumption), because of the increased means which more people would have to satisfy this particular taste, might be 1.5-2.0 million dollars (foreign value), or 90-100 percent more than with no change in income.

SCHEDULE 4. WOOD AND MANUFACTURES, AND RELATED ITEMS PROVIDED FOR IN THE FREE LIST

INTRODUCTION AND SUMMARY

All items covered by schedule 4 of which the imports in 1939 exceeded \$100,000 are included in this report except the basket classification covering miscellaneous manufactures of wood or bark which had an import value of \$801,000 in 1939. This classification included many unrelated articles which are subject to different influences, and it would be impracticable to say anything significant concerning effects of changed conditions upon post-war consumption, production, imports, and exports. The number of dutiable articles for which comments are presented is 12. The value of the imports of these articles in 1939 was 22.0 million dollars, out of a total value of 23.5 million dollars for all articles imported under this schedule.

In addition to the dutiable items, the reports which follow include 10 duty-free items which are related to the dutiable items. The total value of the imports of these free articles in 1939 was 25.6 million dollars.

By far the most important item in the dutiable imports under schedule 4 is softwood lumber, of which the imports, virtually all from Canada, in 1939 were valued at 15.0 million dollars. In domestic production softwood lumber ranked second among the articles dutiable under schedule 4. The imports in 1939 were equal to about 3½ percent of the domestic production. The largest item in domestic production is wood furniture, which is subject to a duty of 25-40 percent ad valorem, and of which the imports in 1939 were equal to about one-sixth of 1 percent of the domestic production.

As measured by imports, the principal duty-free items covered by this group of reports are pulpwood, shingles, hardwood lumber, and cabinet wood logs. Except for cabinet wood logs, these items are also very important in domestic production, but several other articles rank high in domestic production although relatively low in imports. Shingles are duty-free only up to a specified quantity.

The following tabulation compares actual production (for the domestic market) and actual imports in 1939 with the estimated post-war production and imports under the several assumptions as to national income and levels of duty:

Period, income level, and tariff treatment	Production for the domestic market		Imports	
	Value	Ratio to 1939	Foreign value	Ratio to 1939
Wood and manufactures, dutiable and taxable:				
1939.....	1,019.6	100	22.0	100
Post-war long term:				
Per capita income as in 1939:				
Duty as in 1939.....	1,021.5	100	23.7	108
Duty reduced 50 percent.....	1,020.2	100	25.6	116
Duty increased 50 percent.....	1,022.6	100	21.6	98
Per capita income 75 percent more than in 1939:				
Duty as in 1939.....	1,729.6	170	35.9	159
Duty reduced 50 percent.....	1,727.4	169	38.7	176
Duty increased 50 percent.....	1,731.8	170	32.4	147
Wood and manufactures, free items:				
1939.....	284.9	100	25.6	100
Post-war long term:				
Per capita income as in 1939.....	318.7	112	29.1	110
Per capita income 75 percent more than in 1939.....	442.7	155	43.4	170

In 1939 the sum of the values of production (for the domestic market) for the dutiable items covered by these reports was 1,020 million dollars, and the value of imports was 22 million, imports being equal to about 2 percent of the value of production. This ratio is understated to some extent, but not greatly, by reason of duplications of values in the production data. The production of the 10 related duty-free items was valued (including relatively little duplication) at 285 million dollars, and the imports at 25.6 million, equal to about 9 percent of the domestic production figure; the ratio of imports to production is fairly high for shingles and pulpwood.

On the assumption of national income the same as in 1939, estimated production of the dutiable articles covered would probably be only slightly greater in the long-term post-war period than in 1939 notwithstanding growth in population; production also would probably be only insignificantly affected by a 50-percent change in the rates of duty in either direction. Moreover, such changes in the duties would have only a moderate effect on the imports. This is explained chiefly by the fact that the principal item in the import trade, softwood lumber, is subject to low rates of duty, averaging 6 percent ad valorem in 1939.

According to the estimates, an increase of national income by 75 percent would result in increasing the value of the production of the major articles dutiable under schedule 4 by about 70 percent, a result owing largely to higher prices for lumber and other forest products. Increase in the quantity of lumber consumed would probably be restricted by the limitations in the productive capacity of the forests, of both the United States and Canada. It is estimated that the ratio of imports to production would be about the same at the higher as at the lower income level, under each of the three assumptions as to rates of duty.

It is estimated that the value both of production and of imports of the free items, in the long-term post-war period would probably be

about 10 percent greater than in 1939, if per capita national income were the same as in that year. An increase of 75 percent in the national income would probably have less effect, percentagewise, in increasing the value of production, but somewhat more effect in increasing the value of imports, than on that of dutiable items.

The summary estimates in the above table are subject to an appreciable margin of error, notwithstanding the tendency of errors in the estimates for individual items to offset one another. Moreover, as to imports of dutiable articles, the dominance of the one item of softwood lumber is conspicuous, and any error in the estimates regarding imports of softwood would be conspicuously reflected in the total. So, too, the dominance of two items in the statistics of domestic production, namely furniture and softwood lumber, tends to lessen the trustworthiness of the combined totals estimated for domestic production, although any errors in the estimates for these two items may tend to offset one another. The offsetting of errors is probably more effective in lessening the margin of error in the group totals of duty-free articles. The number of these articles is considerable and no one of them is dominant either in imports or domestic production.

SOFTWOOD LUMBER

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
401	Softwood lumber: Western white spruce, Northern white pine, and Norway pine.	\$0.50 per M B. M.	2%
	Other spruce and pine, and fir, hemlock, and larch.	\$2.00 per M B. M.	10%
	1803 (1) Cedar	\$1.50 per M. B. M.	3%

NOTE.—The Tariff Act of 1930 imposed a duty of \$1 per thousand board feet on all lumber covered by this report except cedar, which was duty-free. The Revenue Act of 1932 imposed an import-excise tax of \$3 per thousand board feet, effective June 21, 1932, on all such lumber, which tax was in addition to the regular duty. On January 1, 1936, pursuant to the first trade agreement with Canada, the duty was reduced to 50 cents per thousand board feet and the tax to \$1.50, a quota being fixed on imports of Douglas fir and Western hemlock which could be entered at the reduced rates. Effective July 1, 1938, the Revenue Act of 1938 removed the import-excise tax on Northern white pine, Norway pine, and Western white spruce. The reduced rates of duty and tax were continued pursuant to the second Canadian agreement, effective January 1, 1939, but the tariff quota on Douglas fir and Western hemlock was removed.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million board feet)	21,242	801	20,441	608	21,047	Percent 2.9
Value (\$1,000)	445,453	26,306	419,056	15,049		
Unit value (per M board feet)	\$20.97	\$32.96	\$20.50	\$24.53		
Persons employed (number)	435,000					

¹ Foreign value.
² Estimated.

Softwood lumber is produced in the United States principally in the Pacific Northwest and the South, although other regions, including the Northeast and the Lake States, also produce substantial quantities. Although some species of softwoods possess specific qualities which make them preferred for certain specialized purposes, in many uses one species may be readily substituted for another. This fact, coupled with the relatively high transportation cost involved in shipping lumber, makes proximity to the market an important factor in determining the species used for various purposes in different localities.

Imports of softwood lumber consist primarily of spruce, fir, pine, hemlock, larch, and cedar. The total quantity imported in 1939 constituted about 3 percent of domestic consumption, but the imports of three species, namely, spruce, Northern white pine, and cedar, represented much larger proportions of the consumption of these species. The proportion of consumption of a given species supplied by imports does not indicate fully the competitive position of imports in the domestic market, as differences in quality are important in some instances. Whereas imports of Douglas fir, hemlock, larch, and Western red cedar compete directly with domestically produced lumber, imports of some other species do not compete directly with domestic lumber. For example, imported Northern white pine is generally of higher quality than domestically produced lumber of this species and is used for more specialized purposes.

Nearly all of the imports of softwood lumber come from Canada, but small quantities of ponderosa pine and other species are obtained from Mexico and some Parana pine from Brazil. Most of the lumber imported from eastern and central Canada enters markets along the northeastern seaboard and the Great Lakes. Some imported softwood lumber enters the Pacific coast market, but relatively little enters the South.

Normally from 60 to 70 percent of all softwood lumber consumed in the United States is used in construction, about 10 to 20 percent goes into boxes, crates, and shipping, and about 5 to 10 percent is used in manufacture. During the war the proportion of such lumber used in construction (including military construction) has been reduced to about 50 percent, and boxes, crates, and dunnage have used more than 40 percent. In the post-war years, it is probable that the normal pattern of use will eventually be restored, although the proportion of lumber used in construction may be above pre-war normal in the early period.

Exports, which normally amount to less than 10 percent of production, consist mainly of Southern pine, Douglas fir, and ponderosa pine. Japan, China, the United Kingdom, and Argentina were the principal markets for United States exports during the decade before the war.

POST-WAR SHORT TERM

Consumption and production will probably remain at a high level for several years after the war, owing to a large accumulated demand for new construction, maintenance and repairs, and to the vast requirements in manufactures and other industrial uses. It has been

variously estimated that from 6-10 million or more dwelling units will be erected during the first decade following the war, as well as a large amount of heavier construction. The capacity of both the United States and Canada to produce softwood lumber without undue depletion of the stands is limited. During the war, production in both countries has exceeded the rate of growth. It seems likely that if the demand in the immediate post-war years is extremely strong, this practice of over-cutting will continue for some time. Consequently, consumption and production of softwood lumber may be from 40 to 60 percent greater in quantity than in 1939. The average price of lumber, including both softwood and hardwood, has materially increased during the war. Although it is probable that lumber prices will decline somewhat from the war levels, softwood lumber will presumably be considerably higher in price than in pre-war years. It is possible, therefore, that the value of consumption and of production in the immediate post-war years may be from 100 to 130 percent greater than in 1939.

Probably imports will increase over those in 1939 in about the same ratio as production. However, a larger percentage of increase may occur in exports, which might possibly be 125 to 175 percent greater in quantity, and 240 to 280 percent greater in value, than in 1939. Exports will be affected by the policy of the United States Government in supplying foreign requirements for rehabilitation, by the financial position of importing nations, and by other factors.

POST-WAR LONG TERM

Consumption, Production, and Imports

Estimates of consumption, production, and imports in the post-war long term, compared with 1939 data, are summarized in tables 1 and 2 and are described below.

TABLE 1.—*Softwood lumber: Estimated quantities of consumption, production, and imports under the assumptions of Senate Resolution 341*

[In millions of board feet]

Period, income level, and tariff treatment	Consumption	Production for domestic market	Imports
1939.....	21,047	20,441	606
Post-war long term:			
Income as in 1939:			
Duty as in 1939.....	19,000-23,000	18,400-22,300	600-700
Duty reduced by 50 percent.....		18,350-22,250	650-750
Duty increased by 50 percent.....		18,450-22,350	550-650
Income 75 percent over 1939:			
Duty as in 1939.....	25,000-27,000	24,250-26,150	750-850
Duty reduced by 50 percent.....		24,200-26,100	800-900
Duty increased by 50 percent.....		24,300-26,200	700-800

TABLE 2.—*Softwood lumber: Summary of estimated production and imports under the assumptions of Senate Resolution 341*

Period, income level, and tariff treatment	Production for domestic market		
	Quantity (million bd. ft.)	Price per MBM	Value (\$1,000)
1939.....	20, 441	\$20. 50	\$419, 100
Post-war long term:			
Income as in 1939:			
Duty as in 1939.....	18, 400-22, 300	} 20. 50	376, 000-458, 000
Duty reduced by 50 percent.....	18, 350-22, 250		
Duty increased by 50 percent.....	18, 450-22, 350		
Income 75% over 1939:			
Duty as in 1939.....	24, 250-26, 150	} 25. 00	605, 000-655, 000
Duty reduced by 50 percent.....	24, 200-26, 100		
Duty increased by 50 percent.....	24, 300-26, 200		
		Imports	
1939.....	606	\$24. 83	\$15, 049
Post-war long term:			
Income as in 1939:			
Duty as in 1939.....	600-700	} 25. 00	15, 000-17, 500
Duty reduced by 50 percent.....	650-750		
Duty increased by 50 percent.....	550-650		
Income 75% over 1939:			
Duty as in 1939.....	750-850	} 30. 00	22, 500-25, 500
Duty reduced by 50 percent.....	800-900		
Duty increased by 50 percent.....	700-800		

Per capita income at 1939 level.

It seems likely that construction in general in the long-term post-war period will be greater than before the war, even if national income is at the same level as in 1939. However, a great part of the increase in construction would probably be accomplished through the use of basic materials other than wood. Moreover, the pre-war trend toward greater use of plywood, wallboard, and similar materials in interior construction in place of lumber is likely to continue, though this trend may be partly offset by new developments in the chemical treatment of softwood for use for such purposes. There is considerable uncertainty as to the result of these conflicting factors upon the consumption of softwood lumber.

Despite a large volume of construction, the consumption might be somewhat less than in 1939, notwithstanding the assumed increase of 10 percent in the population. On the other hand, the consumption might be greater than in 1939 by about the percentage of increase in population. Consumption might thus range from, say, 10 percent less than in 1939, or about 19 billion board feet, to about 10 percent more than in that year, or about 23 billion board feet. Prices of softwood lumber at this income level are likely to be about the same as in 1939. The volume of consumption is not likely to be affected appreciably by a decrease or an increase of 50 percent in the duties. The share of consumption furnished by imports will vary somewhat with the rate of duty, but in any case the imports are not likely to reach 5 percent of the consumption, so that the percentage effect of a change in duty upon the domestic production would be small.

Duty as in 1939.—Imports would probably be about 600-700 million board feet, with a foreign value, at prices approximately the same

as in 1939, of 15.0-17.5 million dollars. The domestic production for the domestic market, on this assumption regarding imports, would be about 18.4-22.3 billion board feet, with a value, at 1939 prices, of 376-458 million dollars.

Duty reduced by 50 percent.—The effect might be somewhat to increase the imports of Douglas fir, hemlock and spruce (except Western white spruce), which constituted about one-half of the volume of imports in 1939; these are moderately priced woods and bear higher rates of duty than the other principal softwood species, imports of which would be affected only to an insignificant degree by the reduction in duty. Imports might total 650-750 million board feet, with a foreign value of 16.0-18.5 million dollars. Production for the domestic market would be substantially the same as on the first duty assumption.

Duty increased by 50 percent.—The imports of Douglas fir, hemlock and Eastern spruce might be 10-20 percent less than with unchanged duties. Total imports might amount to 550-650 million board feet, with a foreign value of 14-16 million dollars. Production for the domestic market would be substantially the same as on the first duty assumption.

Per capita income 75 percent higher than in 1939.

With such a high national income, the volume of building construction would probably be very large and the demand for lumber, if that demand could be supplied, might constitute about the same proportion of the total demand for basic construction materials as under the lower income assumption. If it were possible to obtain all the softwood desired, the consumption might be 30 billion board feet or more.

It is improbable, however, that such quantities of lumber would be forthcoming in the United States and Canada. If the demand were recognized as temporary, it might be met by unduly rapid cutting of the forests, but if lumber producers considered strong demand to be likely to continue they would hesitate to adopt that policy. Moreover, the Governments of the United States and Canada are increasingly exerting pressure on producers to pursue sustained-yield practices. It seems doubtful whether actual consumption of lumber under these conditions would exceed 25-27 billion board feet. On the other hand, the assumed strong demand would tend to raise prices considerably; they might be 20-30 percent higher than in 1939.

There is little reason to suppose that the share of imports in supplying the United States market under this income assumption would be materially different, whatever the rate of duty, from their share in supplying the smaller consumption assumed on the basis of income as in 1939. Comments on this schedule assume that high national income in the United States would be accompanied by high income in other countries. This assumption means that costs of production would tend to rise in Canada as in the United States, and also that the demand for exports of Canadian lumber to countries other than the United States (especially to the United Kingdom) would be strong. Under these conditions, Canadian producers would scarcely be likely to seek to divert lumber from other export markets to the United States market.

Duty as in 1939.—Imports might be 750–850 million board feet, which, at prices perhaps averaging \$30 per thousand (in 1939 the average was \$24.83), would have a foreign value of 22–25 million dollars. Domestic production for the domestic market would then probably be 24.3–26.2 billion board feet, with a value, at prices averaging perhaps \$25 per thousand, of 605–655 million dollars.

Duty reduced by 50 percent.—Imports might total 800–900 million board feet, with a foreign value of 24–27 million dollars. Domestic production for the domestic market would be only slightly smaller in quantity or value than on the assumption of the duty as in 1939.

Duty increased by 50 percent.—Imports might be 700–800 million board feet, with a foreign value of 21–24 million dollars. Domestic production for the home market would be only slightly larger than on the first assumption as to duty.

Exports

Even for as much as a decade after the war the production of lumber in Europe may be less than before the war. Many forests have been seriously damaged or destroyed. Even in the long-term post-war period there will, therefore, probably be a strong demand for exports of lumber from the United States. That demand, however, will have to compete with the demand of the domestic market, and particularly so if income in the United States and in other countries is far above the pre-war level. Under these conditions, it is virtually impossible to forecast the exports of lumber in the long-term post-war period, although it is likely that in the short-term period they will be somewhat greater than before the war. Exports will depend to some extent on the trade policies of foreign countries, particularly the policy of the British countries with respect to Empire preference.

In 1939 United States exports amounted to about 800 million board feet. In the long-term post-war period they might be 1.0–1.5 billion board feet. The average unit value of exports before the war was much higher than that of production for the domestic market; it was nearly \$33 per thousand. Prices of export lumber would probably still be higher if world income were high. The value of exports might conceivably vary anywhere between 30 million and 60 million dollars under different conditions with respect to world income.

Employment

Data on the number of wage earners engaged in the production of softwood lumber are not available, but the census reported a total of 361,000 workers in the lumber and timber basic products industry¹ in 1939. Softwood lumber constitutes about 85 percent of the total lumber production in the United States. On this basis, it may be assumed that approximately 307,000 workers were employed in producing softwood lumber and other softwood products in 1939.

Considering the long-term production, it is probable that 275,000–325,000 wage earners would be employed in the production of softwood lumber (and related products) under the 1939 level of income; and between 350,000 and 400,000 if the national income increases 75 percent.

¹ Includes sawmills, planing mills, plywood plants, veneer and cooperage stock mills, and logging operations.

CABINET WOOD LUMBER

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939) (Weighted average)
404	Cabinet woods, sawed, and sawed, planed, and tongued and grooved: Spanish cedar, lancewood, ebony, box, granadilla, mahogany, rosewood, satinwood, Japanese white oak, and Japanese maple— not further manufactured than sawed (rough) or in the form of flooring.	15% (plus import-excise tax) (6% from Cuba).	12%
1803 (1)	Above species planed, or tongued and grooved and other woods.	Free (subject to import-excise taxes).	2%

NOTE.—The species specified above by name, if not further manufactured than sawed, or if in the form of flooring, were dutiable under the Tariff Act of 1930 at 15 percent ad valorem; if planed, or tongued and grooved, they were duty-free, as were other species whether in one or the other foregoing stages of manufacture. The Revenue Act of 1932 imposed on all lumber, whether dutiable or free (except flooring of maple, birch, or beech), an import-excise tax of \$3 per thousand board feet. On September 3, 1934, the preferential duty of 12 percent on Cuban mahogany was reduced to 6 percent and the preferential tax of \$2.40 per thousand board feet on such mahogany was reduced to \$1.20, pursuant to Cuban trade agreement. Pursuant to the first Canadian trade agreement, effective January 1, 1936, the tax on all these species was reduced to \$1.50, and on January 1, 1939, the tax on the species mentioned above by name was restored to \$3 per thousand board feet, as a result of the second agreement with Canada. Pursuant to the trade agreement with Peru, effective July 29, 1942, the duty on Spanish cedar, granadilla, mahogany, rosewood, and satinwood (in rough form) was reduced from 15 percent to 7½ percent, and the tax on these species was reduced once more from \$3 to \$1.50 per thousand board feet. Philippine products were free of duty in 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (M board feet):						Percent
Par. 404.....	130,232	2,940	27,292	{ 78 33,261 }	60,631	55
Par. 1803 (1).....						
Value (\$1,000):						
Par. 404.....	13,665	509	3,217	{ 10 1,622 }		
Par. 1803 (1).....						
Unit value (per M board feet).....	\$121	\$173		\$49		
Persons employed.....	(¹)					

¹ Mahogany and lauan only. Production data are not available for other species, but relatively little of such species is converted into lumber. As to walnut lumber see footnote to text.

² Foreign value.

³ Several thousand (estimated).

GENERAL

Mahogany, lauan (Philippine mahogany), Spanish cedar, Japanese white oak, lancewood, ebony, box, granadilla, rosewood, satinwood, and other cabinet woods commonly imported into the United States are not grown commercially in this country,¹ although lumber of some

¹ As to walnut, a major cabinet wood which is produced in this country, see the section in this series on cabinet wood logs.

of these species is manufactured in this country from imported logs. Lauan (and a few associated species) from the Philippines, which entered duty-free, made up two-thirds of the cabinet wood lumber imports in 1939, and mahogany, chiefly from Mexico, Central America, Peru, and Brazil, constituted more than one-fourth. These woods are normally used principally for furniture, ship finish, partitions, and other cabinet work, and for pattern stock, but during the war they have been used mainly in aircraft and boat construction.

It is probable that the proportion of lumber, compared with logs, imported in the future will be greater, because of the increase during the war of facilities for manufacturing lumber in foreign countries; consequently the share of domestic production in the total consumption of cabinet wood lumber will probably decline.

Changes of 50 percent in the rate of duty would have no material effect on the quantities imported, or cause any substantial shift in imports from lumber to logs (which are duty-free), or vice versa. Very little of the imported lumber is subject to the ad valorem rate provided in paragraph 404, since it is either planed on one or more sides and, therefore, further manufactured than sawed, or consists of species not enumerated in paragraph 404. Consequently, most of the lumber is subject to the free-list provisions of paragraph 1803 (1) of the tariff act. Although all of it, except shipments from the Philippine Islands, is subject to the tax of \$3 or \$1.50 per M board feet provided for in the revenue act, this represents a very small ad valorem equivalent.

Hardwoods from the Philippine Islands consist almost wholly of several species of lauan, usually marketed as Philippine mahogany. In the event of Philippine independence and of the subjection of products of the islands to United States tariff duties, these woods are species which would be subject to the tax of \$1.50 per M board feet, but not to the ad valorem rate provided in paragraph 404. Inasmuch as the tax is relatively small, the change to dutiable status probably would not affect imports from the Philippines.

Domestic production of this type of lumber in 1939 consisted principally of mahogany. Exports were entirely of this species. As mahogany is one of the higher priced woods of this group, the average unit values of domestic production and exports are substantially greater than those of imports.

POST-WAR SHORT TERM

Consumption will probably be substantially greater than in 1939, owing chiefly to the strong demand for furniture of these woods. Imports will probably be considerably greater, while production might increase in moderate degree. Prices will likely be considerably higher, so that the value of production and imports might be much greater than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

By reason of increase in population, consumption of cabinet wood might be 10 percent greater than in 1939 or about 67 million board feet. Imports might, however, be 15 percent greater than in that

year, or about 38 million board feet, valued at \$1,860,000 (foreign value), prices remaining as in 1939. Production, including exports of perhaps 3 million feet, might be about 5 percent greater than in 1939, and range in the neighborhood of 32 million board feet, valued at \$3,880,000.

Per capita income 75 percent higher than in 1939.

At this level of income the furnishing of homes, particularly with the more expensive class of furniture, and a greater demand for pleasure craft, partitions, and other commodities would probably result in a consumption of cabinet woods about 50 percent greater in volume than in 1939, or approximately 90 million board feet. Prices might be 15 percent higher than in 1939. Imports might reach a volume of 50 million board feet (50 percent above 1939), with a foreign value of approximately \$2,900,000. Production, including exports, might be about 43 million board feet, valued at \$6,000,000.

Exports

Exports have consisted mainly of mahogany lumber, and the United Kingdom, Canada, and Japan have been the principal markets.

It is probable that exports in the long-term period at the 1939 level of income will be about 10 percent greater than in 1939 or approximately 3.2 million board feet with a value of \$555,000. Should the national income be 75 percent higher, exports might be as much as 20 percent greater than in 1939, or about 3.5 million board feet, with a value of about \$700,000.

Employment

Data concerning employment are not available, but it is probable that several thousand wage earners are engaged in producing cabinet wood lumber in the United States.

CANE, REED, CANE WEBBING, AND SPLIT RATTAN

Tariff paragraph: 409.

Commodity: Cane, reed, cane webbing, and split or partially manufactured rattan, n. s. p. f.

Rate of duty: 20 percent.

GENERAL

Data on United States production, imports, and consumption are given below:

Item	Production	Imports	Apparent consumption	Ratio of imports to consumption
Value (\$1,000).....	1 900	3 155	1,055	Percent 14.7

¹ Estimated; exports are not reported but are small.
² Estimated landed value; foreign value was \$116,000.

Cane, reed, and cane webbing (woven cane), and split or partially manufactured rattan are materials derived from rattan by a splitting or cutting process. They are used extensively for seats, backs, panels,

spline, molding, and other purposes in wood furniture, in woven reed and cane furniture; and for covering seats in public vehicles. Other uses include snowplow, street sweeper, and push brooms; baskets, trays, and bags; hatbands, toys, and many other types of utility and novelty products. Other materials utilized for many of the same purposes tend to limit the use of rattan.

Cane, reed, and cane webbing are produced in the United States from imported rattan, partly for sale as such and partly for use in further manufacture by the producer.

Pre-war imports were chiefly from Hong Kong, China, and Germany. They comprised some grades and types of lower quality than the domestic products, but also some that competed directly with them.

Imports in 1939 were smaller than usual; in value they averaged for the 5-year period, 1936-40, about \$150,000, equaling a landed value of approximately \$205,000.

POST-WAR SHORT TERM

Demand is likely to be large, but the supply is likely to be insufficient to meet the potential requirements, because both domestic production and imports will probably be limited by scarcity of rattan. Imports of unmanufactured rattan may be considerably lower than the average for 1936-40. The pre-war accumulated stocks have been depleted. Consequently, the domestic production of reed, cane, and webbing is likely to be below normal. Imports of these products are also likely to be less than the average for 1936-40, since it is probable that the export demands for unmanufactured rattan will restrict the quantities that may be processed in the exporting countries (see report in this series on unmanufactured rattan).

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Production of wood and reed furniture would probably be equal to that in 1939, or exceed it by approximately the percentage of population growth. Some of the other products in which rattan materials are used may be produced in slightly increased volume. As an offsetting factor there may be greater use of substitute materials. It is probable, therefore, that the value of consumption of cane, reed, webbing, and split rattan may range from about the 1939 value to about 10 percent above it, or, say, about \$1,100,000.

Duty as in 1939.—With no change in duty it is probable that imports would be about equal to the average for 1936-40 and that the prices would be the same, giving about \$150,000 as the foreign value. The value of domestic production would thus be about \$950,000.

Duty reduced by 50 percent.—With duty reduced imports might increase by about 10 to 15 percent over the average for 1936-40, or to a total of about \$170,000 (foreign value). In part, these increased imports might consist of lower grades and types of cane and reed which may be used in connection with various cheap or novel articles or used in place of other types of material in articles such as brooms. They would, however, probably also include grades and qualities

that would directly compete with domestic cane and reed. Domestic production might be valued at about \$930,000.

Duty increased by 50 percent.—This would probably have a relatively small effect in reducing imports below the 1936-40 level. The materials that are regularly imported have fairly well-established market outlets and the small addition to price which the increase in duty would cause would not seriously affect the cost of the articles in which the imported materials are used. Imports, however, might decline to about \$140,000 (foreign value), and the value of domestic production would then be about \$960,000.

Per capita income 75 percent higher than in 1939.

Products, with some exceptions, in which cane, reed, and webbing are used, especially furniture, are sensitive to income changes, and would probably be produced in greatly expanded volume. The use of cane and reed might not increase in the same ratio as the end products, since, in the case of furniture for instance, prosperous conditions may result in a greater proportion of luxury types utilizing other materials, or a greater use of plastic materials either as a matter of preference or as substitutes for cane and reed. The standard uses of cane and reed, however, in all likelihood would be large and it is also probable that the prices would increase in about the same ratio as the general price level, or about 10 percent. As a result, value of consumption might be 50 to 60 percent greater than in 1939, or approximately \$1,600,000.

Duty as in 1939.—It is probable that the foreign articles would be subject to the same price increases, or about 10 percent, as the total consumption and that they would be in approximately the same ratio to consumption as before the war. In this event, the foreign value of imports would be about \$200,000, and the value of domestic production \$1,400,000.

Duty reduced by 50 percent.—The reduction in duty would permit greater imports. A part of these might be put to uses where they would not compete with domestic cane or reed, and thereby increase our consumption slightly. A substantial part of the increase, however, might be of qualities and grades that would compete with the domestic product. The foreign value of imports might be about 70 to 100 percent greater than in 1936-40, or about \$275,000, and the value of domestic production might be \$1,325,000.

Duty increased by 50 percent.—Imports would probably be a little less than under the 1939 rate of duty, say, \$185,000 (foreign value), with a value of domestic production of about \$1,415,000.

Exports

Exports of cane, reed, and cane webbing are not separately recorded, but they probably are insignificant.

Employment

There are only about five or six domestic concerns engaged in manufacturing cane, reed, and cane webbing from imported rattan. The cutting or splitting of the rattan and the weaving of the webbing are done by machines in this country, but attendants or operators are required for each machine. Some of the concerns are engaged solely

in the production of materials of this type; others are engaged in manufacturing a wider range of products. The number of workers engaged in the manufacture of cane and reed is small.

MANUFACTURES OF RATTAN, BAMBOO, AND WILLOW

Tariff paragraph: 409.

Commodity: Rattan, bamboo, osier or willow manufactures (except furniture and baskets).

Rate of duty: 45 percent.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production	Imports	Apparent consumption	Ratio of imports to consumption
Value (\$1,000).....	1 872	3 326	1, 198	Percent 27
Persons employed (number).....	(?)			

¹ Possibly includes some semimanufactured products not comparable with imported articles. Export data not available but probably negligible.

² Estimated landed value; foreign value was \$187,000.

³ Several hundred.

GENERAL

Manufactures (except furniture and baskets) of which rattan, bamboo, and willow are the principal components include many articles, such as garden rakes, paper parasols, paper lanterns, lamps, table mats, trays, bird cages, and carpet beaters. Many of these commodities are novelty articles with small unit values, and personal preference largely governs the buyer in the choice of the article.

Imports normally amount to about one-fifth of consumption. Japan supplied about three-fourths of the pre-war imports, and China and the United Kingdom most of the remainder. Except for a small quantity of willow, the rattan, bamboo, and willow used in the domestic manufacture of these articles are imported.

POST-WAR SHORT TERM

The value of consumption will probably be substantially less than in 1939, owing to the reduction of imports caused by disturbed conditions in the Far Eastern countries. The value of imports will likely be about one-third of that in 1939. Although the imports of manufactured rattan as material for domestic production of these articles may be below the 1939 figure, inasmuch as the Netherlands Indies, Malaya, and the Philippine Islands may not have regained normal production, the value of the domestic output of articles made of rattan, bamboo, and willow may be as high as in 1939 because of increased prices.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Value of consumption might be about 10 percent greater than in 1939, or say \$1,300,000, by reason of increased population. Prices would probably be the same as in 1939.

Duty as in 1939.—Production and imports would probably increase in proportion to consumption, and be valued at \$960,000 and a landed value of \$360,000 (\$206,000 foreign value), respectively.

Duty reduced by 50 percent.—Imports might be 25 percent greater than with the duty as in 1939, or about \$260,000 (foreign value). Production would probably be valued at about \$900,000.

Duty increased by 50 percent.—Imports might be 10-15 percent less than with the duty as in 1939, or about \$185,000 (foreign value). Production might be about \$1,000,000.

Per capita income 75 percent higher than in 1939.

The value of consumption might be 35-40 percent greater than with income as in 1939, or say, around \$1,800,000, allowing for prices probably about 15 percent higher.

Duty as in 1939.—Production and imports also would probably be about the same proportion of consumption as in 1939 and reach a value of about \$1,300,000 and \$280,000 (foreign value), respectively.

Duty reduced by 50 percent.—Imports might be as much as 25 percent greater than with an unchanged duty, or about \$350,000 (foreign value). Production might be approximately \$1,200,000.

Duty increased by 50 percent.—Imports might be about \$250,000 (foreign value). Production would likely be in the neighborhood of \$1,400,000.

Employment

Employment data are not available, but the number of employees engaged in making articles of rattan, bamboo, and willow is known to be small, probably not more than a few hundred workers.

FURNITURE OF RATTAN, REED, WILLOW, GRASS, OR FIBER

Tariff paragraph: 409.

Commodity: Furniture of rattan, reed, bamboo, osier or willow, malacca, grass, seagrass, or fiber of any kind.

Rate of duty: 60 percent ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports ¹	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	3,427	(²)	3,427	4400	3,827	Percent 10
Persons employed (number).....	850					

¹ Includes \$163,000 (foreign value), or \$220,000 estimated landed value, duty-free imports from Philippine Islands.

² Small.

³ Estimated.

⁴ Landed value, freight, insurance, etc.

Furniture of rattan, reed, bamboo, willow, and other fiber consists chiefly of chairs, stools, settees, sofas and related seating and lounging pieces, principally for porch, garden, summer home, and recreation use. It may be of woven or basketwork construction, or, when made from whole rattan (as distinguished from reed or cane), of the type known as stick rattan furniture.

Formerly this furniture had wide use as living room and library furniture and domestic production was large. This general use declined, and since 1933 the value of domestic output has been less than 4 million dollars annually. The domestic products are made chiefly of rattan, reed, and fiber, the last named consisting of paper sized with glue, twisted or spun into strands: During the war the manufacture of rattan and reed furniture has virtually ceased because of the short supply of rattan (which originates in the Far East). Some simulated rattan furniture made from hardwoods has been manufactured, but it would not be covered by the tariff classification under consideration.

Imports are chiefly of furniture made of rattan, reed, and peel (cane). There are also some imports of willow, grass, and bamboo pieces, but virtually none made of paper fiber. Some of the imported articles have novelty or special appeal which would permit them to be sold here irrespective of duty increases. The Philippine Islands, Hong Kong, and China are the predominant sources of imports. Duty-free imports from the Philippines, first reported separately in 1936, have shown a decided upward trend; after 1937 (until interrupted by the war), they constituted about two-thirds of the total.

POST-WAR SHORT TERM

Over-all demand for furniture is likely to be large, with furniture of the class under consideration sharing in the general expansion to the extent that supplies are available. However, both domestic production and imports of rattan-base furniture are likely to be limited by scarcity of rattan. Increased production of fiber, grass, and willow furniture may to some extent counteract the relative shortage of the rattan products, but it is not probable that the combined supply and sales of furniture of all the materials included in this classification will expand in the same proportion as furniture in general.

There probably will be some imports, as the manufacturing and export organizations in the Far Eastern sources, specially in the Philippines, may be partly restored within a short period after liberation. But these sources are not likely to recover sufficiently to export at normal pre-war levels for several years. Imports from the Philippines probably would not be seriously affected if they became subject to duty by virtue of Philippine independence, in view of the strong demand for, and limited supplies of, rattan furniture in the immediate post-war years. Later on, however, the situation would probably change to the disadvantage of Philippine suppliers.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

With per capita income at the 1939 level substantial increase in the sales of this furniture, or shifts to higher priced articles which would tend to increase the total value of consumption of furniture of rattan, etc., are not probable. The effect of population increase may be wholly or partly offset by substitution of furniture of other materials. Value of consumption is likely, under these conditions, to be 3.8-4.2 million dollars. Estimates of imports under different levels of duty are based on the assumption that full duties will apply to Philippine goods, but as stated in the introduction to this series of reports a different post-war tariff situation may result with respect to the Philippines. The imposition of a duty probably would have a serious effect on shipments from the islands, but would not be likely to result in entire discontinuance of the manufacture of this type of furniture in the Philippines for export to the United States. However, whether the duty were changed by 50 percent, or whether Philippine furniture became dutiable, the domestic production would probably be not far from 90 percent of the total sales, or, say, 3.5-4 million dollars.

Duty as in 1939.—Imports from the Philippines might be about 50 percent lower than in 1939, when they were duty-free, and those from other sources slightly larger than in 1939, the foreign value of imports from all sources probably amounting to about \$190,000, or about 80 percent of the 1939 foreign value.

Duty reduced by 50 percent.—Imports from the Philippines might be only slightly smaller than in 1939 (when they were free of duty), although those from other Far Eastern sources might be somewhat larger, and imports of low-priced willow chairs from Europe, which virtually ceased some years before the war, might be resumed. Under these conditions, foreign value of all imports would probably be about \$315,000, or nearly two-thirds greater than if the duty were unchanged.

Duty increased by 50 percent.—Imports from the Philippines probably would be only slightly less than with an unchanged duty whereas those from other sources would probably be substantially smaller. Total foreign value of imports might be about \$135,000, or approximately 30 percent less than with duty at the present level.

Per capita income 75 percent higher than in 1939.

Under conditions of high national income there would probably be larger demand for furniture of special functions such as resort, club, summer house, porch, and garden use, which probably would result in increased sales of furniture of rattan, reed, and other fibers. In addition to increases in quantity the total value would probably be greater because of the larger proportion of luxury, or higher priced, types that would be used, although it is unlikely that the price level of comparable items would be much higher than in 1939. However, the percentage of increase in the demand for fiber furniture may be somewhat less than that in the over-all demand, since it is probable

that furniture of metal and other materials, especially of newly adopted and synthetic materials, would be widely adapted for these special uses. It is probable, therefore, that the sales of furniture of rattan, willow, and other fiber would be about 40 to 55 percent greater than in 1939, or about 5.4-6.0 million dollars. Roughly 90 percent of this total would presumably be produced in this country, or, say, furniture having a value of 5.0-5.5 million dollars.

Duty as in 1939.—The effect of imports from the Philippine Islands becoming dutiable would be somewhat less restrictive under the higher than under the lower income level, for with the higher income there would be a relatively greater demand for novelty and specialty items which are not seriously affected by duty changes. The value (foreign) of imports from all sources if the rate of duty were the same as in 1939 might be about \$300,000, or 60 percent greater than under conditions of lower income at the same duty level.

Duty reduced by 50 percent.—A reduction in the rate of duty, in combination with increased demand, would be likely to result in substantial imports from Europe and other sources of novel and standard types of hand-made furniture, in addition to increased imports from other sources including the Philippines. Total foreign value of imports might be 50 percent greater than if the rate of duty were unchanged, or about \$450,000.

Duty increased by 50 percent.—The value of imports probably would be about \$230,000, or about 25 percent smaller than if no change in duty were made.

Exports

Exports of furniture of this type are small and are not recorded separately.

Employment

Employment statistics for this type of furniture are not reported separately. Hand labor is largely employed, although the manufacture of webbing of paper fiber is a machine operation. The number of concerns making the furniture is small. It is probable that the total number of workers does not exceed 800 to 1,000.

BASKETS AND BAGS

Tariff paragraph: 411.

Commodity: Baskets and bags of bamboo, wood, straw, papier mâché, palm leaf, or compositions of wood.

Rate of duty: 50 percent.

NOTE.—The rate shown above is that fixed in the Tariff Act of 1930. It was reduced to 25 percent ad valorem, effective January 30, 1943, pursuant to the Mexican trade agreement, with reservation of the right to withdraw or modify the reduction after termination of the emergency.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (thousands).....	(1)	(1)	(1)	11,821	(1)	<i>Percent</i>
Value (\$1,000).....	2,216	(1)	2,216	857	4,073	21
Persons employed (number).....	1,000					

1 Not available.
 2 Landed value; foreign value was \$476,000.
 3 Estimated.

The baskets covered by this report include clothes and shopping baskets, self-service baskets, picnic, toy, Easter, flower, dog, baby, candy, sewing baskets, and fancy baskets for special uses. The bags under consideration are generally similar to baskets, but are usually flexible. Veneer baskets for shipping fruits and vegetables, although they would be covered as baskets of wood in paragraph 411, are not considered in this discussion, because imports are negligible and their use is distinct from that of most imported baskets.

Before the war, the bulk of United States imports of baskets and bags consisted of clothes and market baskets of willow, chiefly from Poland, and fancy baskets of wood or wood composition, mostly from Japan. Bamboo and straw baskets and bags, comprising most of the remainder, came chiefly from China and Japan. Since the beginning of the war in Europe imports of straw baskets and bags from the British West Indies and willow baskets from Argentina have increased.

Domestically produced baskets and bags are made principally of veneer or splint, reed, rattan, and willow. Rattan, reed, and most of the willow used in domestic manufacture are imported, either in the crude or semiprocessed form. Exports are small.

POST-WAR SHORT TERM

The number of baskets and bags consumed in the early post-war years may be about the same as in 1939, or possibly slightly less because of lack of availability of normal imports. Imports will probably be much smaller than in 1939, probably no more than half, since Japan probably will export none to this country, and China, Poland, Germany, Belgium, and other countries whose production was interrupted by the war will have fewer of such commodities for export. Domestic production of rattan, reed, and cane baskets and bags may be less, owing to shortage of raw materials, but increased production of splint, willow, and other types may compensate for the loss. Prices will probably be considerably higher than in 1939. The value of imports might be somewhat less than in that year, owing to their reduced quantity, but the value of production is likely to be greater.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

By reason of increase in population, the consumption of baskets and bags of these materials might be about 10 percent greater than in 1939 or about \$4,500,000, prices remaining as in 1939.

Duty as in 1939.—Production and imports would probably supply about the same proportion of the consumption as in 1939, and be valued at approximately \$3,550,000 and \$525,000 (foreign value), respectively.

Duty reduced by 50 percent.—Imports might possibly be 35–40 percent greater in value than with no change in duty, or about \$725,000 (foreign value). Production would probably be valued at about \$3,200,000, or approximately the same as in 1939.

Duty increased by 50 percent.—An increased duty might result in imports being about 20 percent less than with the duty as in 1939 or about \$425,000 (foreign value). Production would probably reach a value of \$3,700,000.

Per capita income 75 percent higher than in 1939.

At this income level, the consumption of baskets and bags, particularly flower and Easter baskets and fancy baskets and bags, would probably be considerably increased. The greater use of paper bags and of metal and plastic baskets and bags might tend to offset this increase, but the total value of consumption, including the effect of probably higher prices, might be about 25 percent greater than with income as in 1939, or, say, about \$5,700,000. Prices, both domestic and foreign, might be 15 percent higher than with income as in 1939.

Duty as in 1939.—Production and imports will probably increase in about the same proportion and, therefore, range in the neighborhood of \$4,500,000 and \$675,000 (foreign value), respectively.

Duty reduced by 50 percent.—With a reduced duty imports would probably supply a larger proportion of the total consumption, since foreign producers would be likely to avail themselves of the advantage afforded by the higher prices and lower rate of duty. The value of imports might be 40 percent greater than with no change in duty, or about \$950,000 (foreign value). Production would probably approximate \$4,000,000.

Duty increased by 50 percent.—Imports at this level of duty might be 20 percent less than with duty as in 1939, or about \$525,000 (foreign value), while production would probably be valued at about \$4,750,000 (50 percent greater than in 1939).

Exports

Very few baskets and bags of these materials are likely to be exported.

Employment

The Census reported 1,377 persons engaged in 1939 in the manufacture of rattan and willowware (except furniture) and baskets, other than fruit and vegetable baskets. Most of these (estimated 1,000) were probably employed in making baskets and bags. Assum-

ing the same ratio of employment to production as in 1939, the number of persons employed in the long-term post-war period would range between 1,000 and 1,500, on the basis of the above estimated production.

BENTWOOD FURNITURE

Tariff paragraph: 412.

Commodity: Bentwood furniture and parts of.

Rate of duty: 42½ percent ad valorem.

NOTE.—The rate fixed in the Tariff Act of 1930 was 47½ percent ad valorem, which was reduced to 42½ percent, effective July 24, 1933, by Presidential proclamation under section 336 of the tariff act. A further reduction to 22 percent was made effective on January 30, 1943, pursuant to the trade agreement with Mexico, with reservation of the right to withdraw or modify the reduction after termination of the emergency.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption ¹
	Total	For export	For domestic market		
1939: Value (\$1,000).....	\$ 800		800	\$ 290	1,080
1937:					
Value (\$1,000).....	\$ 800		800	\$ 528	1,328
Persons employed (number).....	\$ 350-400				

¹ This total has little significance; see text below.

² Estimated.

³ Foreign value of knocked-down chairs and parts. Value of domestic production is that of set-up, or complete, chairs manufactured entirely in the United States.

Bentwood furniture consists principally of light-weight chairs of which the component sections are made of wood bent to shape, as distinguished from sawed pieces commonly utilized in cut-wood furniture. The chairs are used chiefly in institutions such as restaurants, schools, hotels, offices, assembly halls, and similar places of public assembly.

Imports are in the form of knocked-down chairs or standard parts which are fitted and set up in the United States before the chairs are ready for domestic distribution. The import, or entered value, as given in the above table, is the foreign value of the knocked-down parts, and represents only about 40 percent of the sales value of the chairs when they are set up ready for marketing in the United States; this sales value includes cost of transportation to this country, the duty, and the cost of setting up the parts. Calculated on this basis the market value of imports in 1939 was about \$700,000, apparent consumption was about \$1,500,000, and imports represented about 47 percent of total consumption. The comparable figures for 1937, a more representative year as regards imports, were about \$2,000,000 for consumption and \$1,250,000 for imports, which accounted for about 62 percent. In the following discussion the "value of consumption" will be given on the basis of estimated United States sales value of all chairs. The United States sales value is also the basis for estimating the value of domestic production. "Value of imports," however, where used alone and not in reference to value of consumption, will refer to the foreign value of the knocked-down chairs and parts.

In the normal pre-war years (before 1939) the sales in the United States of imported bentwood chairs were much greater than sales of chairs of wholly domestic manufacture. The year 1939 was not representative of normal imports because of the unsettled conditions in Czechoslovakia and Poland, which were the dominant sources.

Since the outbreak of the war in Europe the manufacture of bentwood chairs in this country has been undertaken by a former leading European producer whose product had been marketed here in pre-war days by an importing representative. Whether this concern will continue, after the war, its entire manufacture of chairs (including all parts) in this country, will manufacture some in full and import parts for others, or will import all the parts and conduct only the setting-up operations here will probably be determined by post-war tariff policy. Whether or not this concern discontinues importing parts, there will probably be some imports by other concerns.

Only a few domestic concerns manufactured bentwood chairs before the beginning of the war, and such furniture constituted less than 1 percent of the total output of furniture in the United States.

POST-WAR SHORT TERM

Demands for furniture in general will be large, and bentwood will probably share in this demand because of institutional requirements that have been deferred during the war. It is probable that the value of consumption may be substantially greater than in 1939. Domestic production, which is likely to supply nearly all of this, will probably be much greater than in 1939. Because of war's ravages in Europe, particularly Poland, imports are likely to be very small; the European industry, as rapidly as it can be reestablished, will probably dispose of most of its output to supply European rehabilitation demands.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Owing to the probable continuance of the trend toward greater use of materials other than wood for furniture, consumption of bentwood furniture, despite population increase, may be somewhat less than in a normal pre-war year (as stated above, 1939 was not a normal year), although it might somewhat exceed the pre-war figure, which was about \$2,000,000. The value of the domestic and foreign furniture together (including cost of setting up the foreign furniture, etc.) might be between \$1,950,000 and \$2,100,000, if the duty should be as in 1939. The change in the duty might somewhat affect the value of consumption, but the extent cannot be estimated.

Duty as in 1939.—Under the rate of duty in effect in 1939 (the present rate having been fixed in 1943), normal pre-war imports (on the basis of sales value in the American market as above calculated) were approximately five-eighths of the total consumption. This proportion would probably be restored in the post-war long-term period, unless the large former European concern which is now operating in this country on account of war conditions should decide to continue to make all, or a certain proportion, of the parts which it uses in this country instead of importing them.

(a) If this company should manufacture all of its parts here, the share of the imported furniture in consumption would probably be not more than one-third as great as in 1937; it might be around 20 percent, in which case the foreign value of imports would probably be from \$150,000 to \$170,000, corresponding to a value in finished condition of \$390,000 to \$420,000. Domestic production, accounting for about 80 percent of the total value of consumption, might range from \$1,550,000 to \$1,700,000, or approximately double the pre-war figure.

(b) If, on the other hand, the concern mentioned should decide to import all of its parts from Europe, the imported product would again probably represent about five-eighths of the total consumption, the value in finished condition being around \$1,200,000 to \$1,300,000, corresponding to a foreign value (for the parts) somewhere between \$480,000 and \$520,000, roughly the value of the 1937 imports. Under this contingency the value of production would be slightly below or slightly above the pre-war figure, ranging perhaps from \$740,000 to \$860,000.

Duty decreased by 50 percent.—Under this condition the large concern mentioned would most probably import all of its parts and knocked-down chairs. Moreover, it, together with other foreign producers, would have a better position in competition with the domestic industry. The imported chairs might come to represent as much as 70 percent of the consumption, with a value in this country, for the finished product, somewhere between \$1,350,000 and \$1,475,000. This would correspond to a foreign value for the parts of perhaps \$540,000 to \$590,000. Domestic production would then have a value somewhere between \$585,000 and \$630,000.

Duty increased by 50 percent.—Under this condition the concern mentioned would probably make most of its chairs wholly in this country, and the imports of other concerns would also be smaller than with an unchanged duty. The value of the imported furniture in finished condition might not be over 15 percent of total consumption. The total foreign value of imports in that case might be between \$115,000 and \$125,000, less than one-fourth of the value in 1937. Production would be correspondingly larger than with an unchanged duty, perhaps ranging from \$1,675,000 to \$1,800,000.

The foregoing estimates of values (\$1,000) may be summarized, as follows:

Item	No change in duty	Duty reduced	Duty increased
Estimated consumption—			
United States value of finished furniture (1,000 dollars).....	1,950-2,100	1,950-2,100	1,950-2,100
Share supplied by imports (percent).....	(a) 20 (b) 62	70	15
United States value of imported product (1,000 dollars).....	(a) 390-420 (b) 1,200-1,300	1,350-1,475	290-315
Foreign value of imports (46 percent of U. S. value) (1,000 dollars)	(a) 155-170 (b) 480-520	540-590	115-125
Value of domestic production (1,000 dollars).....	(a) 1,550-1,700 (b) 740-800	585-630	1,650-1,785

Per capita income 75 percent higher than in 1939.

With this income the number of amusement and institutional places using bentwood chairs would expand and replacements would be made more promptly. Total consumption (at least on the assumption of no change in duty) might be about 50 percent greater than with an unchanged income, amounting to perhaps 2.9-3.2 million dollars. With the larger income the proportion of the consumption supplied by imports would probably be about the same, under each of the three rates of duty, as with an unchanged income. Applying the methods of calculation used above, the resulting estimates of values might be somewhat as follows ((a) and (b) refer to the corresponding alternatives described above):

Item	No change in duty	Duty reduced	Duty increased
Estimated consumption—			
United States value of finished furniture (1,000 dollars)	2,900-3,200	2,900-3,200	2,900-3,200
Share supplied by imports (percent).....	(a) 20 (b) 62	70	16
United States value of imported product (1,000 dollars).....	(a) 580- 640 (b) 1,800-2,000	2,050-2,250	435- 480
Foreign value of imports (40 percent of United States value) (1,000 dollars)	(a) 230- 260 (b) 720- 800	820- 900	175- 190
Value of domestic production (1,000 dollars).....	(a) 2,300-2,550 (b) 1,100-1,200	800-1,000	2,450-2,765

Exports

Very few bentwood chairs are exported from the United States.

Employment

Total employment in the manufacture of bentwood furniture is relatively small. In 1939 it is estimated that 300 to 350 workmen were employed. During the war this number has increased considerably, and if the domestic industry continues to manufacture the bulk of the chairs sold in the United States, the number of workers will probably be doubled.

WOOD FURNITURE**(Other than bentwood)**

Tariff paragraph: 412.

Commodity: Chairs, and furniture of wood, and parts, n. s. p. f.

Rate of duty: Chairs, and parts of wood furniture, n. s. p. f.—40% ad valorem; furniture of wood, n. s. p. f.—25%.

Equivalent ad valorem (1939): 29% (wtd. avg.).

NOTE.—Furniture of wood (including chairs), and parts, were dutiable under the Tariff Act of 1920 at the rate of 40 percent ad valorem. The rate on furniture (except chairs) was reduced to 25 percent effective January 1, 1939, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For ex- port	For do- mestic market			
Value (\$1,000).....	500,048	1,579	498,469	1,790	499,259	Percent 0.2
Persons employed (number).....	140,000					

¹ Foreign value.

² Estimated.

Wood furniture includes household, office, public-building, institutional, and professional furniture, and office and store fixtures and partitions. The last-named category includes some items which are not covered by the tariff provision for wood furniture, and upholstered wood furniture, which also is included in production, is susceptible of tariff classification according to component material other than wood. However, imports of items under either of these exceptions are rare.

Household furniture constitutes about 80 percent of the total domestic output, and most of it is produced on a commercial basis with extensive use of mechanical equipment and by mass-production methods. A small part, about 2 or 3 percent, of the total consists of a type known as custom, or noncommercial, furniture. This type, hereafter referred to as noncommercial furniture, is distinctive in design, requires a large amount of hand labor in its manufacture and appeals to a limited class of customers.

Imports in the main are household furniture of this noncommercial type. They consist in part of newly manufactured articles, in part of old furniture that does not meet the requirements for free entry as antiques, and in part of knocked-down hand-carved frames for upholstered pieces. The finished, or complete, articles are imported chiefly from the United Kingdom and France and the frames come principally from Italy. Imports have seldom amounted to as much as 1 percent of total domestic consumption, although constituting a substantially larger proportion of the consumption of noncommercial furniture. Although imports in general are of a distinctive or special character, or in the nature of luxuries, changes in the rate of duty would affect their quantity. It is not probable, however, that foreign furniture will be able to compete with the great bulk of the domestic product, even with a 50-percent reduction in the duties.

POST-WAR SHORT TERM

Furniture consumption in the post-war short term is likely to be exceptionally large because of the pent-up demand resulting from wartime deferred purchases and the requirements arising from wartime and post-war marriages and increased residential construction.

In view of these conditions, it is likely that production of wood furniture (including wood-frame upholstered furniture) will be sub-

stantially larger than in 1939, as it is probable that the industry can quickly adjust itself to the great demand.

Imports are likely to be lower than in 1939. The industries in the United Kingdom and France may be reestablished sufficiently to produce some furniture for export, but the trade with Italy and other European countries will probably take longer to become reestablished.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

With income at the 1939 level, it is likely that wood furniture consumption will be equal to about 95 to 105 percent of the 1939 total, or about 475-525 million dollars. Increased demand resulting from population growth will probably be offset in large part, if not more than offset, by greater use of furniture of other material, and the fact that extensive purchase of new furniture during the short term after the war will be likely to result in a low replacement demand for several years, unless national income is much higher than in 1939.

Domestic production would be substantially the same as consumption, both imports and exports being relatively insignificant.

Duty as in 1939.—The rate of duty on furniture of wood, n. s. p. f., except chairs, was reduced from 40 to 25 percent ad valorem January 1, 1939. The effect of this change was not fully reflected in imports prior to the outbreak of the war, and it is probable that under normal trade conditions it would result in an increase of about 25 to 30 percent in the imports of the furniture on which the duty was reduced. Assuming no change in the considerable imports of articles (mostly chairs) on which the duty was not reduced, this would increase total imports about 20 to 25 percent over 1939, or to \$950,000-\$1,000,000 foreign value.

Duty reduced by 50 percent.—A further decrease of 50 percent in the duty on furniture other than chairs (or from 25 to 12½ percent) might result in some additional increase in imports. A reduction of 50 percent in the present rate of duty on chairs might result in a substantial increase. The average increase over 1939, in all imports, might be as much as 30 to 40 percent, giving a total foreign value of about 1.0-1.1 million dollars.

Duty increased by 50 percent.—An increase of 50 percent in the rate of duty on chairs might result in a substantial reduction of imports below the 1939 level. The effect of an increase in the rate on other furniture, however, might be less decisive, since the increased rate would be lower than that in effect before 1939. Moreover, the demand for the special types of furniture which are imported is only moderately affected by increase in price. The decline in chair imports might be as much as 25 to 35 percent, but the average decline below 1939 for all furniture would probably not be more than 10 to 15 percent; total foreign value of imports in such event being about \$675,000 to \$750,000.

Per capita income 75 percent higher than in 1939.

Furniture consumption readily responds to increased national income, as under prosperous conditions individuals and business and industrial organizations either buy more furniture or buy furniture of a better grade and higher price. Also, requirements multiply for

resorts, hotels, country and beach homes, recreational purposes, and other uses identified with generally prosperous conditions. Two factors, however, may tend to check the increase in the value of wood furniture consumed. Technical changes and economies of operation, especially those developed during the war, may effect savings in manufacturing costs, with the result that the increase in prices for many grades of this furniture might be less than the probable increase of 10-15 percent in the general price level of commodities. Furthermore, the greater relative use of materials other than wood may, to some extent, lessen the increase in wood furniture consumption. Nevertheless, the purchases of wood furniture would probably be very large, and might be 80 to 100 percent greater than in 1929, or 900 million to 1 billion dollars annually. The value of production would be substantially the same as the value of consumption.

Duty as in 1939.—Under conditions of increased national income there is likely to be a greater percentage of increase in the demand for foreign articles of furniture, which are luxury articles with a specific appeal from artistic or other standpoints, than for the domestic furniture. With duties at the present rates (the rate on furniture other than chairs is already only 62½ percent of that in effect before 1939), it is probable that imports would increase 100 to 150 percent over 1939, or to a total of about 1.6-2.0 million dollars.

Duty reduced by 50 percent.—A decrease in the rates of duty by 50 percent would probably result in greater imports from the customary sources, and possibly relatively larger increases from other sources. For instance, Belgium, which for a few years was a large exporter to the United States, might again increase its shipments to this country. It is probable that imports under these conditions might increase by 150 to 200 percent over 1939, or to a total of about 2.0-2.4 million dollars.

Duty increased by 50 percent.—Such an increase would tend to hold down imports, but in view of the increase in income, with resulting demand for luxury articles, imports would probably be somewhat greater than in 1939. The increase might be in the neighborhood of 20 to 30 percent, the total value of imports being about \$950,000 to \$1,000,000.

Exports

Exports of wood furniture in late pre-war years and during the war have amounted to about 1.5 million dollars annually. Before 1930 they ranged in value from 3.5-4.5 million dollars. Canada and Mexico have been the principal markets, but shipments were made to many other countries. They are of the general or commercial type, and include office, upholstered, and nonupholstered furniture. In the post-war short term there is likely to be a need for furniture from the United States for rehabilitation in the devastated countries. Moreover, in many other countries there will probably be a backlog of demand which could not be supplied during the war years. It is probable, therefore, that exports will experience considerable expansion, probably increasing to about 5-6 million dollars, or three to four times as large as in 1939. This amount probably will not persist when the rehabilitation emergency is over, but for the long term, under conditions of 75 percent increase in income in the United States, which is assumed to be accompanied by high income abroad, exports might amount to 3-4 million dollars annually.

Employment

Total employment in the furniture industry as a whole, excluding the mattress industry but including furniture other than wood, in 1939 was 187,000, of which 159,000 were classed as wage earners. Probably about three-fourths of the total, or 140,000 and 120,000 respectively, were connected with wood furniture manufacture. During 1944 employment in the industry, which is partly engaged in war production, was near the 1939 level, but it was estimated by the industry that with the probable strong demand in the immediate post-war period 100,000 to 150,000 more workers can be absorbed. In the long term the number employed will probably be substantially in proportion to the value of production, as estimated above, or about 270,000 persons.

WOOD FLOUR

Tariff paragraph: 412.
Commodity: Wood flour.
Rate of duty: 25 percent.

NOTE.—The rate of duty fixed in the Tariff Act of 1930 was 33¼ percent ad valorem. That rate was reduced to 25 percent ad valorem, effective March 7, 1931, by Presidential proclamation under section 336 of the tariff act.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export ¹	For domestic market			
Quantity (short tons).....	48,668	300	48,368	8,008	56,376	Percent 14.2
Value (\$1,000).....	781	6	776	² 83		
Unit value.....	\$16.04	\$20.00	\$16.04	\$10.41		
Persons employed (number).....	¹ 250					

¹ Estimated.
² Foreign value.

Wood flour is wood of nonresinous species which has been ground and screened to the fineness of flour. Its principal pre-war use was as a filler in the manufacture of two widely different articles, linoleum and dynamite, with a small quantity going into the production of plastics and other manufactures. Under war conditions the chief use is probably in the manufacture of dynamite, with the volume consumed as a filler in plastic manufactures exceeding that for linoleum. Wood flour used in manufacture of plastics is usually better in quality and higher in price than that used for either dynamite or linoleum. Norway was the principal source of wood flour imports into the United States in the pre-war period; no imports have been recorded since 1940. Exports have always been small and have gone chiefly to Canada.

POST-WAR SHORT TERM

The domestic production of wood flour, which increased somewhat during the war, will probably exceed 1939 output, with a shift in the proportions going to the consumers' goods industries. The quantity

used for dynamite is expected to decrease materially from the war level; on the other hand, the quantity required in the manufacture of linoleum will be substantially greater than in 1939 because of the backlog of deferred demand. Other uses, such as in rubber manufactures, roofing felts, plastic wood, and wallboard, are also likely to expand above pre-war levels. Information as to the status of the wood flour mills in Norway is not available; however, imports will probably not attain pre-war volume in the immediate post-war years.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of wood flour is likely to be approximately 35 percent greater than in 1939, or about 75,000 tons, owing to increased requirements in pre-war uses and the addition of new uses developed in recent years.

Duty as in 1939.—Domestic production would possibly be stepped up to about 65,000 tons and, with an increase of 10 percent in unit value, amount in value to approximately \$1,150,000. Imports may be about the same proportion of consumption as in 1939, amounting to about 10,000 tons; allowing for an increase of 10 percent in unit value imports might attain a value of \$115,000 (foreign value).

Duty reduced by 50 percent.—Imports would perhaps be 20 percent greater than with no change in duty, amounting to about 12,000 tons, with a foreign value of about \$140,000. Domestic production would then be about 63,000 tons, with a value of \$1,110,000.

Duty increased by 50 percent.—A higher rate might cut imports to less than one-half of the quantity with the duty as in 1939, or, say, to about 4,000 tons with a total foreign value of \$45,000. Production would probably be 70,000 tons valued at approximately \$1,250,000.

Per capita income 75 percent higher than in 1939.

With a greatly increased per capita income, consumption of wood flour might be 20 percent greater than with income as in 1939, attaining a volume of 90,000 tons.

Duty as in 1939.—Owing to the larger demand and the fact that the increased consumption would probably be mainly of the higher priced grades, unit values may be expected to be about 35 percent greater than on the lower income level. Under these conditions domestic production might reach 77,000 tons, valued at approximately \$1,665,000. Imports might reasonably be expected to be about the same proportion of consumption as in 1939. If so, they would amount to about 13,000 tons with a total foreign value, allowing for the expected 35-percent increase from the unit value under the lower income level, of \$200,000.

Duty reduced by 50 percent.—A lower rate of duty might result in imports of about 16,000 tons; the foreign value might be about \$250,000. Domestic production might be about 74,000 tons; value about \$1,600,000.

Duty increased by 50 percent.—Imports might be curtailed by a higher duty to possibly 6,000 tons. In that case the total foreign value would be about \$95,000. Domestic production might, therefore, amount to about 84,000 tons valued at \$1,800,000.

Exports

Wood flour exports, always insignificant relative to either production or consumption, will in all probability not increase substantially in the post-war term.

Employment

The manufacture of wood flour is essentially a mechanical process and the output per worker is large. Production on the basis of 80,000 tons is in excess of domestic installed capacity and could be met only by increasing the capacity of one or more existing plants or the building of a new mill. Employment would increase proportionately to production and might range between 325 and 425 persons, on the basis of the above-estimated volume of production.

SHINGLES OF WOOD

Tariff paragraph: 1760.

Commodity: Shingles of wood.

Rate of duty: Duty-free.

NOTE.—As originally enacted the Tariff Act of 1930 provided for the duty-free entry of shingles of wood, including red cedar shingles. In the first trade agreement with Canada, effective January 1, 1936, the duty-free status of wood shingles was bound, but the United States reserved the right to impose import quotas on red cedar shingles. This right was exercised in Section 311 of the Revenue Act of 1936, under which imports of red cedar shingles were limited beginning January 1, 1937, to specified quantities fixed semi-annually. These quotas were terminated as of June 17, 1939, upon the formal ratification of the second trade agreement with Canada, the quota provision having been specifically limited in the Revenue Act provision to the operation of the trade agreement entered into with Canada on November 15, 1935. From June 17 to December 31, 1939, imports of red cedar shingles were entitled to unconditional duty-free entry, but for 1940 and succeeding years annual quotas have been fixed in accordance with the provisions of the second trade agreement with Canada, effective January 1, 1939. In that agreement the duty-free status of wood shingles was again bound, but the right was reserved by the United States to impose a duty not exceeding 75 cents per square on red cedar shingles which may be entered in any year after 1938 in excess of annual duty-free quotas. This right was exercised in the Act of July 1, 1940 (54 Stat. 768), by which a duty was imposed on red cedar shingles imported in excess of a duty-free quota fixed annually. The duty is 25 cents per square and the quota is 30 percent of the average annual United States consumption during the three preceding years. Other shingles of wood remain duty-free without quota limitation.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 squares).....	6,500	24	6,476	2,820	4,296	Percent 30.2
Value (\$1,000).....	16,641	82	16,559	17,925		
Unit value (per square).....	\$2.56	\$3.46	\$2.56	\$2.81		
Persons employed (number).....	5,000					

¹ Foreign value.

² Estimated.

Shingles are used chiefly for roofing but also for side-wall coverage of houses and farm structures, and in both new construction and renovation.

Of the wood shingles consumed in the United States before the war, about 95 percent consisted of red cedar shingles produced in Washington and Oregon, and in British Columbia, Canada; the remainder are of other softwood species produced in various regions in both countries. During the war both Douglas fir and Western hemlock have been used

to a limited extent in the making of shingles, and these species may become important in the industry in the post-war era. Shingle consumption varies in large measure with building activity, but variations are affected by character of construction and competition of other kinds of roofing. Wood shingles are not suitable for some types of structures, such as flat-roof buildings, and their use is restricted by municipal ordinances in many urban and congested areas. They meet severe competition from other roofings, especially low-cost composition roll roofing and strip asphalt shingles. Over a long period of years there has been a decline in the quantities of wood shingles used, notwithstanding greatly increased consumption of roofing materials of all types combined. The total quantity consumed in 1939 was considerably higher than the annual average of the pre-war decade and of the war years.

Imports of red cedar shingles exceeded the annual duty-free quotas in 1940, 1941, and 1942; in 1943, however, imports were equivalent to 57.6 percent and in 1944 to 67.4 percent of the duty-free quotas of the respective years owing to relatively low Canadian production resulting from wartime labor shortage and other wartime conditions and to reservation by Canada of 50 percent of her production for the domestic market in Canada.

POST-WAR SHORT TERM

Consumption of shingles in the immediate post-war years will probably not greatly exceed the 1939 quantity, but the total value will be somewhat greater. New construction and repairs and renovation during the first 2 or 3 years after hostilities cease probably will create a demand for wood shingles greater than that during the war, when construction has been restricted, and greater than that of the average for the pre-war decade. Prices may possibly remain at a level of wartime ceilings, and this will adversely affect wood shingles in comparison with the lower priced competitive roofings. The quantity of red cedar shingles that will be entitled to duty-free entry under the present law will be small for several years because of the low consumption in the United States during the war years, but, in view of the high prices, the duty of 25 cents per square will be low in ad valorem equivalent and probably will not confine imports to the duty-free quota. Exports of wood shingles are of insignificant volume and will probably remain so, inasmuch as outside of the United States and Canada there is relatively little use of such roofing.

POST-WAR LONG TERM

Consumption, Production, and Imports

It is assumed in the following estimates regarding imports that the present legislation regarding duty-free and dutiable red cedar shingles will continue in effect; that is to say, that there will be a duty-free quota equivalent for each year to 30 percent of the annual average consumption (i. e., domestic shipments plus imports) during the preceding 3 years, and that imports in excess of the quota determined annually will continue to be dutiable. It may be expected that, owing to the increasing difficulty of obtaining adequate supplies of timber for the production of shingles and the increased cost of process-

ing, prices of red cedar shingles will increase substantially. Because of higher prices the equivalent ad valorem of the present duty of 25 cents per square is not likely to exceed 7 percent in the long-term post-war period. It is doubtful, furthermore, that if the duty were 50 percent higher (37½ cents per square and equal to an ad valorem rate of 11 percent) it would of itself be restrictive of imports to any great extent.

As the quota for a given year is based upon combined domestic shipments and imports in the preceding 3 years, the quota will increase over a period of years in which the national income is high and consumption is increasing. In the long-term post-war period with a high national income, therefore, it may be expected that the duty-free quota on red cedar shingles will be substantially greater than it would be under a low national income.

Per capita income at 1939 level.

It is believed that residential construction in the aggregate will exceed construction in the pre-war period by somewhat more than the increase in population, but construction using wood shingles may show no such increase, both because of a general trend toward use of more durable materials in construction and because of a continuance of the pre-war trend toward substitution of other roofing materials for wood shingles even on houses built of wood. Consumption of wood shingles in 1939 (9.3 million squares) was considerably above average. Consumption in the post-war long-term period might range from about 8.4-9.3 million squares. For reasons already stated, prices both of domestic production and of imports are likely to be considerably higher than in 1939, even with income at the 1939 level; the increase may be about one-fourth, or, say, to about \$3.20 per square for domestic production and \$3.50 foreign unit value for imports.

It seems improbable that, even if the duty on imports in excess of the duty-free quota should be reduced, the imports would materially exceed the quota, which is fixed at 30 percent of consumption. Imports, therefore, might range from about 2.5-2.8 million squares, with a foreign value of about 8.7-9.8 million dollars. Domestic production might thus be somewhere between 5.9 million and 6.5 million squares, with a value of 19-21 million dollars.

Per capita income 75 percent higher than in 1939.

It is probable that with such a high level of income, construction in general would be much greater than with income as in 1939, but it is also probable that the increased demand would be greater for construction materials other than wood than for those of wood. Moreover, as pointed out in the report on lumber, the limitations of timber stands in the United States, and in Canada as well, would probably prevent the production of wood building materials in quantities sufficient to meet the demand which would otherwise exist. This statement applies to wood shingles as well as to lumber. It is possible that if supplies were readily forthcoming, either in the United States or Canada, the consumption of wood shingles under this high income level would be 30 to 40 percent greater than at the lower income level. It seems improbable, however, that the actual consumption will be more than 20 percent greater at the higher income level; it might thus range from about 10-11½ million squares.

Unit values of shingles would probably be considerably higher than at the lower income level, both because of the general advance in commodity prices which would probably take place and because of the physical difficulty of supplying such an increased quantity of shingles. The unit values of domestic production and of imports might be 15 percent higher than at the lower income level, or, say, about \$3.80 for domestic production and \$4.10 for imports (foreign value).

The quantity of imports would probably be approximately 30 percent of the consumption, imports in excess of the duty-free quota probably being small even if the duty should be reduced. Imports might thus range from 3.0-3.4 million squares, with a foreign value of 12.3-13.9 million dollars. The domestic production would then be between 7.0 million and 7.8 million squares, with a value between 26.6 million and 29.6 million dollars.

Exports

The quantity of shingles exported annually from the United States is an insignificant part of production. In most foreign countries various other roofing materials are available and are commonly utilized.

Employment

The output of shingles per man-day is large and the number of 5,000 persons shown as engaged in the industry in 1939 is regarded as a liberal estimate. Any increase or decrease in production would affect employment proportionately; at the maximum production above estimated, employment would probably be about 6,000.

LATH

Tariff paragraph: 1803 (2).

Commodity: Lath.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pieces).....	562, 207	2, 821	559, 386	176, 350	735, 736	Percent 24
Value (\$1,000).....	1, 915	12	1, 903	1 528		
Unit value (per 1,000 pieces).....	\$3. 41	\$4. 25	\$3. 41	\$2. 99		
Persons employed (number).....	2, 500					

¹ Foreign value.

² Estimated.

Lath are rough-sawed strips of wood, most commonly made $\frac{1}{2}$ inch in thickness, 1 $\frac{1}{2}$ inches wide, and 4 feet long. For the most part they are manufactured as a byproduct at sawmills, utilizing slabs, edgings, and short lengths which might otherwise be wasted. They are used chiefly as a base for plastering walls. Consumption has usually fol-

lowed, in fair degree, the general building trend. However, in recent years the greater use of plywood and various wallboards, and the substitution of metal screen and other plaster-supporting materials, have reduced the use of lath. Between 1937 and 1941, when residential construction increased rapidly, the consumption of lath declined. Any large expansion in the prefabricated-houses industry might further reduce lath consumption. Imports, which supply about one-fourth of the lath used in the United States, are almost entirely from Canada, principally the eastern Provinces. United States exports are small.

POST-WAR SHORT TERM

Following the war, a large increase in residential and other building construction is anticipated. According to various reports, from 6-10 million or more dwelling units may be erected in the first post-war decade. The consumption of lath will probably increase over pre-war figures, although probably not in the same ratio as new construction, because of the trend toward the substitution of plywood and wallboard, and the use of other plaster-foundation materials. Production and imports will probably increase in about the same proportion as consumption. The price of lath, and consequently the value of production and imports may be considerably greater than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of lath might vary from 90-110 percent of the 1939 quantity, or from 660-810 million lath, depending on the extent to which the probable increase in construction activity offsets the effect of the downward trend in the consumption of lath. Imports might range from 160-195 million lath, with a foreign value of \$480,000 to \$585,000, and production, including that for exports, from 470-655 million lath, valued at 1.6-2.2 million dollars on the basis of 1939 prices.

Per capita income 75 percent higher than in 1939.

The larger volume of construction which would likely result from an increase in income would probably be reflected in a somewhat greater use of lath. Consumption might be 110-120 percent of the 1939 amount, or about 810-885 million lath. The price of lath would probably follow the general price of softwood lumber, and might be 20 percent above that in 1939. Production and imports would probably increase proportionately to consumption, in which case imports would amount to about 195-210 million lath, with a foreign value of about \$725,000, and production, including that for exports, would be about 600-695 million lath, valued at 2.5-2.8 million dollars.

Exports

Exports of lath are small, amounting to less than one percent of production in 1939. It is improbable that lath will be exported in large volume after the war, owing to their low value, which does not justify heavy freight charges to distant markets. In most consuming

countries, lath are available from nearby sources. With national income at the 1939 level, exports might range from 90-110 percent of that in 1939, or about 2.5-3.1 million lath, valued at \$10,800-\$13,200. Should the national (and world) income be increased, exports might be slightly larger, or approximately 3.1-3.4 million lath (110-120 percent of 1939), with a value of \$15,800-\$17,300 (130-145 percent of 1939).

Employment

A relatively small number of wage earners are engaged directly in the manufacture of lath, possibly 2,500 workers.

TEAK

Tariff paragraph: 1803 (1), 1803 (2).
Commodity: Teak lumber; teak logs.
Rate of duty: Lumber and timber, \$3 per M feet, board measure (import-excise tax); logs, free. *Equivalent ad valorem (1939):* 1.4%.

NOTE.—Teak lumber was free of duty under the Tariff Act of 1930. The Revenue Act of 1932 imposed an import-excise tax of \$3 per thousand feet, board measure, effective June 21, 1932 (I. E. C., sec. 3424), which was reduced to \$1.50, effective January 1, 1936, pursuant to the first trade agreement with Canada. The item was omitted from the second Canadian trade agreement, and the \$3 rate was restored, effective January 1, 1939.

GENERAL

Data on United States imports for 1939 are given below:

Item	Imports (apparent consumption)		
	Logs	Sawed	Total
Quantity (1,000 board feet).....	7	1,871	1,878
Value (\$1,000).....	11	1,404	1,415
Unit value (per 1,000 board feet).....	\$165	\$216	\$216

¹ Foreign value.

There is no domestic production of teak logs. Teak is a dense hardwood found growing commercially in southeastern Asia, chiefly in Burma, Thailand, and Java. The wood has high resistance to wear, water absorption, and decay. The principal use in the United States is in the construction of ships and boats, especially naval vessels, mostly for decking and to a minor extent for gun platforms, rails, ladders, and fittings. Imports are chiefly in the form of large squares 10'' x 14''-14'. The low tax on imports of sawn teak, first imposed in 1932, has not appreciably influenced imports; imports of logs have continued insignificant. As a substitute for teak, the United States Navy has turned during the war to the use of Douglas fir and Southern yellow pine of domestic origin for decking.

POST-WAR SHORT TERM

The Japanese invasion of southeastern Asia halted shipments of teak to the United Nations. The extent to which the Japanese have carried on teak-logging operations is not known, nor is it known what damage has been done to the teak sawmills, whether to prevent their

use by the enemy, or through enemy action itself. An interval of a year or more usually occurs between the girdling of a teak tree preparatory to its felling and the time the logs reach the sawmill. If the Japanese have seriously curtailed logging operations and logs and sawed material at the mills are depleted, it may require from 1 to 2 years after hostilities cease before sawing can be resumed. Imports are likely for a time to be small, but may a little later become as large as, or considerably larger than, in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The construction of naval vessels has largely determined imports in the past. What the naval building program of the country will be in the long-term period is not apparent. In any event, however, a large amount of refitting will be required to offset the wear and tear of the long service of most ships. Of importance as affecting imports will be the decision to be reached by the Navy Department as to whether the use of domestic softwoods, as a substitute for teak, undertaken as a war measure, shall be continued. On the other hand, considerable passenger ship building is likely to occur to replace the casualties of war, and such construction might involve teak. In view of the uncertainty of Navy policy, imports of teak may be at approximately the same level as in 1939—1½–2 million feet annually, or may be much larger. The foreign value of imports (at the 1939 price level) may range from \$400,000 to \$450,000, on the basis of imports of pre-war magnitude, to a much larger figure. A 50 percent reduction or a 50 percent increase in the low tax would have no influence on imports.

Per capita income 75 percent higher than in 1939.

Such an increase in income would tend to widen the uses of teak, particularly in yacht construction. Interest in yachting will doubtless be heightened because of the many men who have acquired experience in navigation during the war. If it be assumed that the Navy will not use much more teak than in 1939, but that increased consumption in other fields will follow expanded construction both of passenger ships and of small boats or yachts, imports of teak might be 30 to 50 percent larger than in 1939, or from 2.4–2.8 million feet. Since teak cannot successfully compete with other desirable woods if the difference in cost is excessively large, it is probable that even in the face of heavier demand, foreign unit values would not advance more than \$25 per thousand feet, or say to about \$240, about 10 percent higher than in 1939. This would bring the total foreign value of imports of the quantity stated to approximately \$575,000 to \$675,000 annually. If the Navy should use much more teak than in 1939, the import figures would be much larger. A change in the low tax would have no effect on imports.

BALSA WOOD

<i>Tariff paragraph:</i>	1803 (1), 1803 (2).	
<i>Commodity:</i>	Balsa wood lumber and balsa logs.	
<i>Rate of duty:</i>	Lumber, \$1.50 per thousand feet, board measure (import-exercise tax); logs, free.	<i>Equivalent ad valorem (1939): 5%</i>

NOTE.—Balsa lumber was duty-free under the Tariff Act of 1930. An import-exercise tax of \$3 per thousand feet, board measure, was imposed by the Revenue Act of 1932, effective June 21, 1932 (I. R. C., sec., 3424). This tax was reduced to \$1.50 per thousand feet, board measure, effective January 1, 1936, pursuant to the trade agreement with Canada, and the reduced rate has remained in effect pursuant to the trade agreement with Ecuador.

GENERAL

Data on United States imports for 1939 are given below:

Item	Imports (apparent consumption)		
	Logs	Sawed	Total
Quantity (1,000 board feet).....	42	6,425	6,467
Value (\$1,000).....	10.9	1,190	1,191
Unit value (per 1,000 board feet).....	\$20.81	\$29.64	\$29.59

1 Foreign value.

Balsa wood does not grow in the United States but is imported chiefly from Ecuador, with small quantities coming from Colombia, Guatemala, Costa Rica, and Mexico. It is the lightest wood known, and weighs from 7 to 22 pounds per cubic foot, being much lighter than cork bark. In the pre-war period its principal use was in the manufacture of model airplanes. Because of its exceptional buoyancy, balsa has been utilized in larger volume during the war in the making of life rafts, life preservers, and buoy floats, and for the core of plywood parts in the construction of certain types of airplanes. Balsa is imported mainly in the form of lumber; in recent years the quantity brought in as logs has been insignificant.

POST-WAR SHORT TERM

Balsa lumber imports during the war years have been four to five times greater than in 1939. Assuming sharp curtailment of the emergency shipbuilding program, the requirements for balsa in making life-saving apparatus will substantially decline. However, it will undoubtedly continue to be widely used for lifesaving devices. Further, the war has stimulated interest in air navigation so that model plane building with balsa in all likelihood will be resumed with greater impetus. War also has demonstrated the thermal- and acoustic-insulating properties of balsa, and this field should add to the demands for the wood. The quantity and value of imports will probably be well above 1939 levels.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Expanded uses of balsa wood in the industrial field, largely because of its successful substitution for other materials through the exigencies of war, may be expected to continue. With these widened uses of balsa and growth of population, imports may be larger by 30 to 50 percent than in 1939, or total 8½–9¼ million board feet. Keen competition among the producers, who will be operating at less than half of wartime capacity, will probably keep prices at little if any above the 1939 level. The total foreign value of imports would probably be about \$250,000 to \$290,000. To increase or decrease the tax (which is low) by 50 percent would affect very little the total volume of imports in the form of sawed wood.

Per capita income 75 percent higher than in 1939.

Higher per capita income would doubtless increase the demand for the products into which balsa wood enters and, in turn, result in larger imports; they might increase to the extent of 50 to 75 percent over the 1939 volume, or to from 10–11.5 million feet annually. Heavier demands on the producing mills in Central America would probably bring about prices higher, by 15 to 25 percent, than those prevailing in 1939. The foreign value of imports might thus range from \$340,000 to \$425,000.

HARDWOOD LUMBER

Tariff paragraph: 1803(1).

Commodity: Hardwood lumber
(other than cabinet
woods, balsa, and
teak).

Rate of duty: Free of regular customs
duty; subject to im-
port-excite tax of
\$1.50 per M board
feet. *Equivalent ad valorem (1939):* 4%.

Note.—No duty was imposed by the Tariff Act of 1930 on lumber covered by this report. The Revenue Act of 1932 imposed an import-excite tax of \$3 per thousand feet board measure, effective June 21, 1932. The tax was reduced to \$1.50, effective January 1, 1936, pursuant to the first Canadian trade agreement, which reduced rate was continued pursuant to the second Canadian agreement.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consump- tion	Ratio of imports to con- sumption
	Total	For ex- port	For do- mestic market			
Quantity (million board feet).....	2,710	226	2,484	60	2,544	1.8
Value (\$1,000).....	99,804	10,959	88,845	12,438		
Unit value (per M board feet).....	\$36.90	\$48.49	\$25.60	\$40.63		
Persons employed (number).....	76,000					

† Foreign value.
‡ Estimated.

This section covers all hardwood lumber except cabinet woods of foreign types (including walnut, which ranks as a cabinet wood but is not imported), balsa, and teak. The imports under consideration consist chiefly of maple, birch, and beech, but there have also been some imports of oak and of other species. Hereafter the term, "hardwood lumber," as used in this statement is to be understood to exclude foreign cabinet woods, balsa, and teak. Hardwood flooring is considered an advanced manufacture of lumber, and though there are small imports and exports of hardwood flooring they are not included in the foregoing statistics.

The domestic production under consideration, in addition to oak, maple, birch, and beech, consists of red gum and tupelo, yellow poplar, cottonwood, ash, basswood, hickory, and other species. In 1939 the domestic production was made up approximately as follows: Oak, 40 percent; maple, birch, and beech, 20 percent; red gum and tupelo, 17 percent; and other species, 23 percent.

Some hardwood lumber is used more or less interchangeably with softwood lumber in construction and in boxes and crates, but the hardwoods are preferred in certain applications, such as in flooring and in some fixtures and millwork. Hardwood lumber also finds preferred outlets in furniture, vehicles, railway cars, farm implements, and handles for tools. In 1940, 28 percent of the hardwood lumber produced in the United States went into flooring; furniture accounted for 27 percent, and boxes and crates for 24 percent. During the war about 50 percent of all hardwood lumber consumed has gone into boxes, crates, and dunnage, while that used in construction and in manufactures, furniture, etc., has been considerably reduced. The pre-war pattern of use will probably be restored after the war. It is possible, however, that chemically treated softwoods may displace some hardwood in flooring and furniture, and that plastic materials may displace hardwoods to a considerable extent for tool handles and some other purposes.

The imports of maple, birch, and beech lumber all come from eastern Canada, but Canada itself imports a substantial quantity of hardwood lumber (largely oak, but also red gum, yellow poplar, walnut, and other species) from the United States. In the United States market, maple, birch, and beech imports in 1939 amounted to less than 2 percent of the total domestic consumption of hardwoods but represented about 8 percent of the United States consumption of these three species. The imports compete most directly with the domestic production of the same species, for the most part in the northeastern quarter of the United States. The imports compete to some extent, but less directly, with domestic oak, but virtually not at all with the domestic production of walnut, hickory, and other hardwood species.

POST-WAR SHORT TERM

It is probable that a large demand will exist. Estimates of residential construction during the first post-war decade vary from 6 to 10 million or more dwelling units, many of which will require hardwood lumber for flooring and interior finish. In addition, a large increase may occur in the production of furniture. The manufacture of vehicles, farm implements, and other products which utilize hard-

wood lumber will probably be considerably greater than in 1939, not only to supply the domestic market but also for export. Hardwood lumber, as well as manufactures thereof, will probably be exported in large quantities to meet reconstruction needs in Europe and elsewhere.

Under these conditions of consumption and exports, both domestic production and imports may be substantially larger than in 1939. The price of hardwood lumber has increased materially during the war and although some reduction in price may occur during the short term it probably will remain considerably above that in 1939. The value of consumption, production, imports, and exports, therefore, may be much greater than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

With an increase in population, the volume of wood, soft and hard, used in building may or may not increase by the same percentage.¹ Whether or not consumption of hardwood lumber expands as much as that of softwoods may depend upon the extent to which plastics, chemically treated softwoods, and other materials are substituted for hardwood lumber, and also the extent of the depletion of the domestic stands of hardwood timber during the war. Cutting during the war has been from the most accessible hardwood timber, and although a large volume of timber will still exist, it may not be economically accessible at the 1939 prices, which would probably prevail at this level of income. Any scarcity of domestic hardwoods could hardly be made up by increase in imports, since accessible stands in Canada are also limited. Under these conditions, therefore, the consumption of hardwood lumber might range from 90 to 110 percent of that in 1939, or from about 3.2 to 3.9 billion board feet. Domestic production would supply the bulk of this consumption, and production for the domestic market may be estimated at the intermediate figure of about 3.5 billion board feet, valued at approximately 90 million dollars (assuming prices as in 1939). Production for the domestic market would vary only slightly under different duty levels, since the rate of duty is low.

Duty as in 1939.—Imports might be 90 to 110 percent of 1939 imports, or about 60 million board feet, with a foreign value of approximately 2.4 million dollars.

Duty reduced by 50 percent.—Although the duty is low, imports might be about 10 percent greater than with the duty as in 1939, or approximately 65 million board feet, with a foreign value of 2.6 million dollars.

Duty increased by 50 percent.—Imports might be about 5 percent less than with no change in duty, or 57 million board feet, with a foreign value of about 2.3 million dollars.

¹ It is probable that total consumption of basic construction materials, including brick, cement, and stone, as well as wood, will exceed the pre-war volume by more than 10 percent. See discussion of the consumption of softwood lumber, p. 510.

Per capita income 75 percent higher than in 1939.

It is probable that the construction and manufacturing demand for hardwood lumber would greatly increase. However, with the standing timber less readily available than in former years, extensive substitution of other materials for hardwood lumber would probably take place for some uses. Under these conditions the price of hardwood lumber might be about 20 percent higher than with income as in 1939, and consumption about 20 to 30 percent greater in volume, or about 4.2-4.6 billion board feet. Production for the domestic market might amount to about 4.3 billion board feet, valued at approximately 135 million dollars.

Duty as in 1939.—Imports would probably be around 75 million board feet, with a foreign value of 3.6 million dollars.

Duty reduced by 50 percent.—Imports might amount to about 80 million board feet, with a foreign value of approximately 4.0 million dollars.

Duty increased by 50 percent.—Imports might be 72 million board feet, with a foreign value of around 3.6 million dollars.

Exports

Before the war the United States exported hardwood lumber to nearly all nations of the world, but the United Kingdom and Canada were the principal markets. In the short-term post-war period the quantity of hardwood lumber exported may be affected, not only by the available supply in this country, but also by the policies of the United States Government regarding rehabilitation in war-torn countries, and by the financial position of foreign countries.

Owing to the probable continued strong demand for lumber in foreign countries for reconstruction purposes even in the long-term period, rather large exports may continue. At the 1939 per capita income level, exports may amount to 120-130 percent of the 1939 figure, or about 280 million board feet, valued at approximately 14 million dollars. If the national income is 75 percent higher than in 1939, the larger domestic demand would compete with strong foreign demand (since income in foreign countries is also assumed to be high), and it is impossible to forecast what would be the effect on the volume of exports.

Employment

In 1939 the census reported 361,000 wage earners employed in the lumber and timber basic products industry,² most of whom were engaged in the production of softwood and hardwood lumber. Since hardwood lumber represents approximately 15 percent of all lumber produced in the United States, it may be assumed that at least the same proportion of wage earners were engaged in its production (including allied products), or about 54,000; the proportion may have been appreciably higher. Accepting 54,000 as the basis for estimates, it is probable that 50,000 to 60,000 workers would be employed in producing hardwood lumber in the long-term post-war period if the national income remains at the 1939 level; and from 65,000 to 80,000 if the national income increases 75 percent.

² Includes sawmills, planing mills, veneer and cooperage stock mills, and logging operations.

POSTS, POLES, AND PILING

Tariff paragraph 1803 (1), 1804.
 Commodity: Posts, poles, piling, and other round timbers.
 Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity:						Percent
Posts (1,000 pieces).....	333,000	1 37	332,663	872	333,835	0.3
Poles (1,000 pieces).....	4,400	55	4,345	376	4,721	8.0
Piling (1,000 linear feet).....	68,500	1,848	67,652	1,373	69,025	8
Value:						
Posts (\$1,000).....	1 39,900	1 5	39,855	1 80		
Poles (\$1,000).....	1 15,180	205	14,975	1 1,178		
Piling (\$1,000).....	1 8,919	383	8,537	1 64		
Unit value:						
Posts (per piece).....	1 80.139	80.139		80.092		
Poles (per piece).....	1 3.45	3.71		3.08		
Piling (per linear foot).....	1 1.80	.996		.144		
Persons employed.....	(9)					

¹ 1935-39 average exports to Canada (from Canadian import statistics); value converted to United States currency. Exports to other countries probably very small.

² Classified as "round timber, n. e. s., including piling;" chiefly piling, but not including round timbers of pine, fir, spruce, hemlock, and larch used for spars or for building wharves (no imports of these species for spars and wharves were reported in 1939).

³ Estimated.

⁴ Foreign value.

⁵ Not available.

Posts, poles, and piling are utilized in large amounts in the United States. The principal characteristics required in these products are strength, and resistance to decay, to attacks by insects, and to other destructive agencies under the various conditions of use. Naturally durable woods, such as cedar, cypress, chestnut, and locust, have long been preferred for these uses. However, the depletion of the supply of such species and more general employment of creosote and other preservatives have resulted in greater use of other species in recent years.

It is estimated that domestic production of poles consists of about 60 percent Southern pine, 20 percent red cedar, and 20 percent Northern white cedar, redwood, lodgepole pine, and other species. About 50 percent of domestic piling is of Southern pine, 28 percent of Douglas fir, and the remaining 22 percent of oak, cypress, and other kinds. Posts, being mostly of local origin, include a wide range of species, although hardwoods probably predominate; cedar, locust, and oak are extensively used.

Preservative treatment of posts, poles, and piling has increased rapidly in recent years. Such treatment doubles or triples the life of such products, and it is probable that the annual requirements in the future will consequently be materially reduced. Concrete and metal are utilized in the fabrication of posts, poles, and piling, but the increased use of wood preservatives will probably reduce the competition of other materials with wood in the future.

Transportation cost is an important factor in the marketing of posts, poles, and piling, because of their bulkiness and relatively low value. Long-distance movement is largely restricted to special grades and sizes of poles and piling. Canada is the chief source of imports into the United States. No detailed data are available concerning the species imported from that country, but in all probability poles and posts are predominantly of Western red cedar and Northern white cedar, and piling of Douglas fir. Moderate quantities of piling of greenheart and other species are imported from British Guiana and Cuba.

POST-WAR SHORT TERM

The pre-war consumption of fence posts probably ranged from 300-400 million posts annually. Fence construction and repair has lagged during the war, and the requirements for posts in the early post-war years probably will be much higher than in 1939. Many farmers probably have been able to make replacements with posts cut on their own land, but extensive repairs will still remain to be done on farms, and additional quantities of posts will be needed for fences along highways and railroads.

The extension of rural electrification lines will probably greatly increase the consumption of poles. Repairs of secondary power lines, telephone lines, and telegraph lines not adequately maintained during the war may also increase demand for poles. New buildings utilizing piling for foundations, and the construction and repair of river and harbor installations, may increase considerably the consumption of piling.

Imports of posts, poles, and piling will probably supply about the same proportion of consumption as in 1939. Exports of poles and piling may be substantially greater than in 1939, owing to the demand for repair of war-damaged structures in foreign countries. Exports of posts before the war were negligible, and need not be considered. Inasmuch as the prices of these products are likely to be materially higher than in 1939, the value of production, imports, and exports might be much greater than in that year.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Expansion of power transmission and telephone lines is expected to continue into the long-run period even if national income should be no higher than before the war. In view, however, of the probably increased employment of preservative treatment, consumption might be only about 10 percent above that in 1939, corresponding to the increase in population. Consumption might, therefore, be approximately 365 million posts, 5.2 million poles, and 55 million linear feet of piling. Production (including relatively small exports) on this basis, might be about 365 million posts, 4.8 million poles, and 55 million feet of piling, the respective values being about 44 million, 17 million, and 10 million dollars. Imports might be about the same proportion of consumption as in 1939, and amount to about 960,000 posts valued at \$88,000; 415,000 poles, valued at \$1,280,000, and 410,000 feet of piling, valued at \$60,000 (all foreign values).

Per capita income 75 percent higher than in 1939.

Consumption would probably be about 25 percent greater in volume than in 1939, or about 415 million posts, 6 million poles, and 60 million feet of piling. Prices might be about 15 percent above the 1939 level. Correspondingly, production (including exports) might be about 415 million posts, valued at 57 million dollars; 5.5 million poles, valued at 22 million dollars; and 62 million feet of piling valued at 13 million dollars. Similarly, imports might be approximately 1.1 million posts, 470,000 poles, and 465,000 feet of piling, the respective foreign values being about \$115,000, \$1,665,000, and \$75,000.

Exports

Japan was by far the largest pre-war market for piling, although China, Venezuela, Canada, Mexico, and certain other countries were important. Poles were marketed principally in Canada, but substantial quantities also went to Mexico, France, Argentina, and elsewhere. Exports of posts were negligible.

With world income at the 1939 level, exports of poles and piling chiefly for reconstruction purposes in the long-term post-war period might be 20 percent greater than in 1939, or about 65,000 poles and 2.2 million feet of piling, the respective values being about \$240,000 and \$455,000. Should the income be 75 percent greater, domestic consumption would probably require most of the production of these products and smaller quantities would probably be available for shipment to other countries. Exports might be about the same as in 1939, or approximately 55,000 poles, valued at \$235,000, and 1.9 million feet of piling valued at \$450,000, prices being about 15 percent higher than in 1939.

Employment

These products are produced largely by numerous small operators and by farmers, and the number of workers engaged varies widely from time to time. No statistics are available concerning employment.

SOFTWOOD LOGS

Tariff paragraph: 1803 (2).

Commodity: Logs of fir, spruce, Western hemlock, and cedar.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (M board feet).....	1 7,023	3 77	6,946	3 118	7,064	Percent 1.7
Value (\$1,000).....	1 92,275	1,043	91,232	4 1,387		
Unit value (per M board feet).....	1 13.14	13.54		11.77		
Persons employed (number).....	4 40,000- 60,000					

¹ Calculated from various statistical data and adjusted to exclude logs utilized for pulpwood.

² Includes a very small quantity of bawn timber.

³ Excludes an estimated quantity utilized as pulpwood, not covered by reported statistics of pulpwood imports, which are large.

⁴ Foreign value.

⁵ Estimated.

This section is concerned with logs of fir, spruce, Western hemlock, and cedar, except those—mainly Western hemlock—used for pulpwood. The latter are included in a separate section on pulpwood. This statement covers the bulk of the imports of logs for manufacture into lumber, shingles, or plywood. There are small additional imports of several species but they are negligible, not only in relation to domestic production of such species, but also in relation to the total imports of logs. The imports of logs herein considered come almost entirely from British Columbia and are processed, along with similar domestic logs, into lumber or other products in mills chiefly in the State of Washington (about three-quarters of the total domestic and imported cedar logs are converted into shingles and a small part of the Douglas fir into veneer for use in plywood).

The imports of logs of fir, spruce, Western hemlock, and cedar have represented less than 2 percent of the domestic consumption of such logs. From some logging areas in Canada, however, it is about as convenient and as economical to move logs to mills in the United States as to Canadian mills, and such areas have been sources of raw material of considerable importance to some United States lumber and shingle mills and plywood plants. Probably the importation of logs would have occurred on a somewhat greater scale had British Columbia regulations not restricted the exportation of timber in unmanufactured condition (from some types of land holdings). The importation of logs, however, under any circumstances would not be likely to be a major factor in United States supplies of softwood lumber, even of those species which have been imported in largest amounts. In recent years taxes on imports of lumber of the species concerned—the logs being duty-free—may have tended somewhat to promote the importation of logs. The taxes on the imports of lumber, however, have been low and cannot have been important in relation to other factors bearing upon the trade.

Under the circumstances above described it is not possible to foresee how future developments will influence the importation of logs. Probably the most reasonable expectation is that such imports will constitute about the same proportion of total consumption of logs of the species concerned as they did in pre-war years. The following estimates are based on that expectation.

Consumption of softwood logs is, of course, determined by consumption of softwood lumber. The probable post-war consumption of lumber is discussed in the report on that commodity. Availability of supplies would probably be a limiting factor under a high national income.

POST-WAR SHORT TERM

A large increase in building and construction is anticipated in the early post-war years and, whereas the quantity of lumber consumed might not increase in proportion to total construction, nevertheless large quantities will be required. The consumption, production, and imports of logs of fir, spruce, hemlock, and cedar will probably be considerably greater than in 1939, and therefore the value of production and imports might be much greater than in that year. Log exports might increase somewhat, although the domestic demand will probably tend to restrict their shipment to other countries.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption and production (including a small production for export) of logs of fir, spruce, hemlock, and cedar would probably be about the same as in 1939, or slightly more than 7 billion board feet, valued at about 95 million dollars. Imports also might be comparable to imports in 1939, and amount to about 120 million board feet, with a foreign value of \$1,400,000. Prices for production and imports are assumed to remain as in 1939.

Per capita income 75 percent higher than in 1939.

Consumption and production of logs might be 25 percent greater than in 1939, or about 8.8 billion board feet. Imports would be likely to increase proportionately and therefore be about 150 million board feet, more or less. Prices would probably be about 20 percent higher than in 1939, or about \$15.75 per thousand board feet for production and \$14.25 for imports. The value of production might be about 140 million dollars, and that of imports 2.1 million dollars (foreign value).

Exports

Pre-war exports of softwood logs consisted largely of Douglas fir, with smaller quantities of hemlock, cedar, spruce, and other species. The bulk of exports were of medium or lower grade logs, although some peeler logs were included. China, Canada, and Japan were the principal markets in 1939.

With the income at the 1939 level, a fair export market would probably exist in countries deficient in timber. Exports might be 25 percent greater than in 1939, or about 95 million board feet valued at about \$1,300,000. Should the world income be 75 percent greater, domestic consumption of logs would likely restrict exports of the better-grade logs, but a larger volume of lower-grade logs might also be produced which it would be as profitable to export as to manufacture into lumber. Exports, therefore, might remain at about 95 million board feet. Prices, however, would probably be about 20 percent higher than in 1939; consequently the value of exports might be about \$1,500,000 (50 percent above the 1939 value).

EMPLOYMENT

Wage earners engaged in the production of logs are not reported separately by the census. However, it is probable that from 40,000 to 60,000 workers are employed under normal conditions. A substantial increase in production might be reflected in employment; probably 50,000 to 70,000 wage earners would be employed at the higher income level.

CABINET WOOD LOGS

Tariff paragraph: 1803 (2).
Commodity: Hardwood cabinet woods, in the log.
Rate of duty: Free.

GENERAL

Data on United States imports for 1939 are given below:

Item	Imports ¹ (apparent consump- tion)
Quantity (1,000 board feet).....	31, 369
Value (\$1,000).....	2, 581
Unit value (per 1,000 board feet).....	82. 27

¹ Reexports of the species covered are negligible. See text regarding domestic production of walnut.

² Foreign value.

Hardwood cabinet wood logs, including mahogany, Spanish cedar, prima vera, satinwood, oriental wood, rosewood, and other species, are imported from many countries. Mahogany, which represented two-thirds of the total imports in 1939, comes principally from British Honduras, Honduras, Mexico, Brazil, and western Africa; other species are derived variously from Mexico, Guatemala, Brazil, Ceylon, Australia, western Africa, and other countries. The woods covered by the import statistics are not produced commercially in the United States; therefore, consumption is identical with imports. Reexports of these species, if any, are negligible. The principal domestic species which commonly ranks as a cabinet wood is black walnut of which there are no imports. The production of walnut lumber in 1939 was 27 million feet. There is only limited and indirect competition between imported cabinet woods and walnut.

Furniture, ship finish, partitions and other cabinet work, and pattern stock are the principal peacetime uses of these species. The bulk of the logs are converted into lumber and the remainder into veneer. During the war consumption has increased because of the demand for mahogany, chiefly for veneer for aircraft and boat construction.

Facilities for manufacturing lumber have increased during the war in some of the countries where the various species grow; consequently it is expected that in the future a larger proportion of the United States consumption of cabinet woods will be supplied by imports of lumber. For this reason the estimates of log imports which follow are lower than they might be otherwise.

POST-WAR SHORT TERM

For a period of several years after the war, the volume of consumption and imports will probably be considerably greater than in 1939, chiefly because of the demand for furniture made of these woods. Prices will probably be substantially higher, therefore, the value of imports might be much greater than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Per capita consumption (imports) of cabinet wood (including that imported both as logs and as lumber) would probably increase but per capita consumption of logs alone might, for reasons indicated, decline somewhat. Nevertheless, owing to increased population, the

total consumption of logs might increase slightly, say 5 percent, over that in 1939 and approximate 33 million board feet valued at around 2.7 million dollars (foreign value).

Per capita income 75 percent higher than in 1939.

With a larger income, mahogany and other cabinet woods would probably be used in greater volume for furniture, partitions, and other purposes. Prices would likely be about 15 percent higher than in 1939. Imports of logs might be about 30 percent greater than with income as in 1939, or about 42 million board feet, valued at approximately 4 million dollars (foreign value), or about 55 percent above that in 1939.

PULPWOOD

Tariff paragraph: 1803 (2).
Commodity: Pulpwood.
Rate of duty: Free.

GENERAL

Data on United States exports, imports, and consumption for 1939 are given below:

Item	Exports	Imports	Wood consumed ¹			Ratio of imported to total
			Imported	Domestic	Total	
Quantity (1,000 cords).....	50	1,288	1,200	9,556	10,816	Percent 12
Value (\$1,000).....	351	10,747	10,280	68,259	84,539	
Unit value (per cord).....	\$7.02	\$8.34	\$12.92	\$7.14	\$7.82	
Persons employed (number).....	32,000					

¹ Quantities and value of pulpwood reported consumed by mills in 1939. Separation of domestic and imported wood estimated on basis of partial segregation in U. S. Census reports. Owing to time lag and the use of inventory wood, domestic production is not equal to consumption minus imports in a given year, nor are imports and imported wood consumed the same in a given year.

² Imports for consumption, 1939, adjusted to include pulpwood classified in import statistics as logs.

³ Difference in unit value between "imports" and "imported wood consumed" is in part due to time lag and in part to fact that value of "imports" is foreign value while that of "wood consumed" is value at the mill.

⁴ Estimated.

Imports of pulpwood represent one of the three forms in which foreign forests contribute to United States wood fiber requirements. Though the imports of pulpwood have been an important factor in supplying these requirements, they are less important, even in terms of weight, than imports of either paper (chiefly newsprint) or wood pulp. In terms of value imported paper and wood pulp are of course of still greater relative importance.¹

Southern pine, spruce and balsam fir, hemlock, white fir, jack pine, and poplar and cottonwood are the woods most extensively used for the production of wood pulp, but various other softwoods and hardwoods are used in smaller amounts. Some woods are more suitable for conversion into wood pulp by some processes than by other processes, and the character of the pulp industry in the several producing regions of the United States is attributable in large degree to the varieties of timber in the forests of each region.

In the northeastern and Lake regions, where United States pulp production was first developed, spruce, balsam fir,² and eastern

¹ For wood pulp and paper see schedule 14.

hemlock predominate in the pulpwood production. All of these are preferred species for use in the sulphite and groundwood processes, and the pulps produced by these processes are used mainly in the production of "white" papers, such as printing, writing, and white wrapping papers. Jack pine and hardwoods also occur in these regions, and are used for the production of sulphate, soda, and special grades of sulphite pulp. Soda pulp accounts for only a small part of total national production, and the northeastern and Lake States account for only a minor fraction of the production of sulphate pulp. The accessible timber in the northeastern and Lake regions has been greatly reduced by years of cutting for pulpwood, saw timber, and other products. Most of the pulpwood that is imported into the United States comes from Canada and is consumed in the northeastern and Lake States. The imports are of principal importance in supplementing the wood supplies of these regions for the production of white pulps. The northeastern quarter of the country accounts for a much larger portion of total consumption than of the total production of pulp, and most of the imported pulp, as well as most of the domestic pulp produced for sale (as distinguished from that for consumption by the same concern) is consumed in this area.

Small amounts of pulpwood are also imported from British Columbia into the Pacific northwest, but in this region the imported wood is only a small portion of the total consumption of the pulp mills. Here, Western hemlock is the species of chief importance in pulp production, white fir, spruce, and Douglas fir also being used; during the war some Western red cedar has also been used as pulpwood. Douglas fir is chiefly used for lumber production; limited quantities are used for pulp, chiefly sulphate. The timber stand in this region is enormous but the forest drain for all purposes is greatly in excess of growth. Wood is probably available for a substantial expansion of production by the existing pulp mills but there is some question whether under present practices of cutting the region could permanently support much additional pulp-mill capacity. This situation may change somewhat with more general use of Douglas fir and of waste from lumber production for pulp, and if wood from Alaska becomes available for such use.

The South is the region of latest development in wood-pulp production. Here Southern pine is the species most extensively used. Formerly this species was not economically convertible by the sulphite or ground wood processes, and the sulphate process predominates in the southern industry, though some sulphite (chiefly dissolving grades) and mechanical and special kinds of pulp (chiefly used in building boards) are also produced from Southern pine. Unbleached sulphate is brown in color and is suitable chiefly for coarse papers and boards where strength is desired but where color is not important. During the war there have been extensive developments in the use of bleached and semibleached sulphate and, if this continues in the post-war period, Southern pine may contribute in large measure to supplying the increased requirements for white paper. Estimates of the Forest Service in 1936 indicated that in the southern region the current drain and growth were about equal. Cutting for pulp and lumber has increased since then, but the stands of timber are large and restocking is more rapid than elsewhere in this country or in Canada, especially in trees of a size suitable for pulpwood. There

is probably, therefore, room for considerable further expansion of pulp production in this region.

The available supply of pulp timber in general is such that for a period of time enough pulpwood could be produced to meet greatly expanded demands, but under present practices of cutting of pulpwood, saw timber, and wood for other forest industries, this would in time result in excessive depletion of reserves. The pulpwood supply base will probably be augmented by wider use of hardwoods and of species of softwoods, such as Douglas fir, of which little has heretofore been used for pulp, by the use of Alaskan wood, and by better utilization of wood; but continuous production of pulp at higher levels could probably be maintained only by general adoption of conservation measures such as tree farming and sustained-yield forest management. The widespread practice of conservation measures might tend temporarily to restrict the supply of available wood, but the Forest Service has reported that under a national program of forest management the forest lands of the United States could be so developed as to support greatly expanded lumber and pulp production.² Although restocking and growth of timber to suitable size for pulpwood would be more rapid than for saw timber, pending the increased yield as a result of such developments the use of imported wood in largely increased volume would probably be necessary for any marked expansion of wood-pulp production in this country.

The imports of pulpwood, almost entirely from Canada, in recent years have accounted for a somewhat smaller percentage of domestic consumption than they did in the 1920's. This is partly attributable to the rapid growth of the southern industry, using entirely domestic wood; and partly to the expansion of the Canadian pulp industry, and the increased importation of its products, in the form of pulp or of newsprint paper, into the United States, in the place of pulpwood.

Imports of pulpwood from Canada have increased during the war, but may not remain at wartime levels, since shipments of wood from Canada are limited not only by the requirements of the Canadian forest industries, but also by government restrictions on the export of unmanufactured wood, which apply generally to timber from Crown or public lands and in some instances to land held under private tenure. Greatly increased demand for pulpwood might result in large imports from the Soviet Union, but any forecasts regarding this are purely conjectural. Large exports from that country to the United States would probably require exploitation of additional virgin-timber territory and the development of new transportation facilities, which would probably not be undertaken unless the demand became urgent and promised to continue. Wood from the Soviet Union could probably be used for most kinds of pulp, and would be acceptable to many mills that have hitherto obtained at least part of their wood from this country itself and from Canada. It is not probable that there would be new construction of mills depending entirely on wood from the Soviet Union.

² "A National Plan of American Forestry" and "National Pulp and Paper Requirements in Relation to Forest Conservation," U. S. Forest Service, Senate Document No. 12, 73d Cong. (1st Sess.), and Senate Document No. 115, 74th Cong. (1st Sess.).

POST-WAR SHORT TERM

Heavy demand for paper, together with rebuilding of pulpwood inventories, will probably result in pulpwood demands greatly in excess of 1939 and somewhat greater than during the war years, when civilian consumption of paper and board has been restricted. Prices are likely to remain about the level of the wartime regional ceilings, which are considerably higher than the 1939 prices. Imports will probably be entirely from Canada, as no European source would probably be in a position to ship wood to this country soon after the war. Imports are likely to be much larger than in 1939, but probably will not supply as large a percentage of the total as in that year because of the larger production of pulp in the South where domestic wood is used entirely. It is to be expected that shortages of labor and equipment which have restricted pulpwood production during the war will be alleviated after demobilization, and that domestic production will be greatly in excess of 1939 both in volume and value.

POST-WAR LONG TERM**Consumption, Production, and Imports*****Per capita income at 1939 level.***

The consumption of pulpwood is likely to increase about 20 percent over 1939, or considerably more than the increase in population.³ It may reach a total of about 13.2 million cords. The price of wood is likely to be slightly higher than in 1939. Imports are likely to be about the same as in 1939 or about 1.3 million cords, with a foreign value of about 11.5 million dollars. Imports will thus be a somewhat smaller percentage of total consumption than in 1939, as a result of a considerable expansion of the pulp industry in the South, where imported wood is not likely to be used in appreciable quantities.

Consumption of domestic wood under these conditions would be about 11.9 million cords, or about 24 percent more than in 1939, valued at about 89 million dollars, or about 30 percent more than the value in 1939.

Per capita income 75 percent higher than in 1939.

Under conditions of increased income, consumption of pulpwood in domestic manufacture of pulp may possibly amount to about 17.5 million cords, or about 35 percent more than with income at the 1939 level and about 60 percent more than the 1939 consumption. Cutting of pulpwood in this volume is likely to be accompanied by an increase of about 20 percent over the 1939 prices.

Imports may range from about 1.5-2.5 million cords, or from about 20 to 100 percent greater than in 1939, valued at from 15-25 million dollars (foreign value). The higher figure of this range is predicated on the assumption that imports in large volume might be made from sources outside of North America. If imports are available only from Canada they probably will be nearer the lower total. Domestic wood consumed under these conditions would amount to from 15-16 million cords, valued at from 130-140 million dollars.

³ For discussion of the demand see the statements regarding paper under schedule 14.

Exports

Exports are small. Some shipments are made to Canada, but it is probable that they will not exceed 50,000 cords in post-war years.

Employment

Cutting of pulpwood is in part seasonal and also to a substantial amount it represents part-time labor of farmers. Probably 30 percent of the total is farm-cut wood. It is estimated that the number of workers engaged in pulpwood cutting in 1939 was equivalent to an average of about 32,000 full-time workers, although a substantially larger number of persons may have been so engaged at times. The number of workers would vary in about the same proportion as production, and might amount to the equivalent of 40,000 men under the 1939 level of income and from 50,000 to 55,000 persons with income 75 percent greater than in 1939.

RAILROAD CROSS TIES
(Except switch and bridge ties)

Tariff paragraph: 1804.
Commodity: Railroad cross ties.
Rate of duty: Free..

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (thousands).....	49,500	1,184	48,316	382	48,698	(1)
Value (\$1,000).....	42,500	1,263	41,237	315		
Unit value (per tie).....	\$0.86	\$1.07	\$0.85	\$0.83		
Persons employed.....	(2)					

¹ Less than 1 percent.
² Foreign value.
³ Not available.

Railroad cross ties comprise hewn and sawed ties, whether treated with preservatives or untreated. Switch and bridge ties are sawed pieces of timber of dimensions which would permit their use in various construction jobs and they are, therefore, omitted from the classification. Hewn ties are the product of thousands of workers, a large proportion of whom cut ties when other work is slack, as in the case of farmers working in their wood lots in winter. Sawed ties are produced by sawmills and commonly form but a small part of the total output of a given mill. Direct data of production of railroad ties are not available, and the figures shown above are estimates based on the number of ties reported by the class I railroads of the United States as used for replacements and for construction of new tracks. By far the greater part of the total consumption is for the maintenance of existing roadbeds.

POST-WAR SHORT TERM

Consumption of cross ties may increase in the immediate post-war years over the 1939 figures, because the unprecedented volume of freight and passenger traffic during the war has resulted in accelerated mechanical wear on rails and ties and a shortage of maintenance manpower has confined current tie replacement to a minimum. To bring roadbeds up to pre-war standard, the railroads will need to make tie replacements annually for several years in greater volume than has been possible during the war. Imports of ties, normally very small relative to domestic production, are likely to increase in the same ratio as production in the United States.

POST-WAR LONG TERM

Consumption, Production, and Imports

As no new construction requiring a large volume of ties is foreseen, the principal use of ties will continue to be in the maintenance of existing roadbeds.

Per capita income at 1939 level.

With per capita income the same as in 1939 the quantity and value of consumption and imports of cross ties would probably be approximately the same as in 1939.

Per capita income 75 percent higher than in 1939.

Inasmuch as railroad-roadbed upkeep must necessarily be maintained to insure the safe and speedy movement of traffic, railroad cross-tie consumption is only slightly influenced by per capita income levels. A per capita income 75 percent higher than in 1939 would, however, result in heavier rail movement with consequent greater mechanical wear on cross ties and therefore somewhat increased replacement needs. However, the effect would probably be to raise the quantities produced and consumed relatively little above 1939 levels. Production might reach 52 million ties and, with an increase of perhaps 10 percent in unit value, the value might be about \$45,000,000. Similarly imports might increase to about 400,000 ties with a foreign value of about \$335,000.

Exports

War has taken heavy toll of European railroads and it seems likely that the United States may be called upon to increase its exports of cross ties in the years immediately following the war, possibly to the extent of 100 to 150 percent over 1939. In such event, total exports might be from about 2.4 to 3.0 million ties valued at approximately \$2,540,000 to \$2,700,000. Normal channels of tie supplies in Europe have been severely disrupted by the war and probably several years will elapse before these normal sources are restored. However, timber is available in many countries of Europe and the production cost of cross ties abroad would not warrant continued imports of higher priced ties from the United States once the pre-war sources of supply are reestablished. For the post-war long-term period, United States exports of cross ties may exceed those of 1939 by 5 percent, amounting to 1,250,000 ties valued at \$1,325,000.

Employment

No data are available on the number of persons engaged in getting out ties. Hewn ties are cut principally by workers who put in only part time, while sawed ties are usually but a small part of the lumber output of a given sawmill.

PICKETS AND PALINGS

Tariff paragraph: 1805.
Commodity: Pickets and palings.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	1 2, 250		2, 250	2 247	1 2, 497	Percent 10
Persons employed.....	(?)					

1 Estimated.
2 Foreign value.
3 Not available.

Pickets or palings are small strips of wood used chiefly in building fences. They are most commonly made of softwood, the species depending mainly upon its relative availability. The more durable woods, such as cedar, cypress, and redwood are generally preferred, but undoubtedly the greater volume of pickets are of pine, fir, spruce, or other species. Pickets can be produced at most of the numerous sawmills and planing mills throughout the country, but no statistics of total production are available. A considerable proportion is produced by retail lumber dealers to fill local orders. Imports, which are valued at about \$250,000 annually, are almost wholly from Canada, principally from the eastern provinces.

Picket fences are nowadays usually built for their distinctive appearance, as well as for their utility, consequently there seems to be no reason to believe that metal or other materials, or hedges, will hereafter replace wood for this purpose to any great extent. There was probably in earlier decades some shift in this direction, but it has apparently run its course.

POST-WAR SHORT TERM

The demand for pickets and palings in the short-term period may be quite large, in view of the anticipated boom in residential construction, and the probable large requirements for repairs postponed during the war. Assuming that the consumption and production of pickets in 1939 were in normal relationship to residential building, it is probable that consumption and production in the early post-war years will be substantially larger in volume. Imports will probably increase proportionately. The price of pickets will probably be materially higher than in 1939, consequently the value of consumption,

production, and imports (foreign value) may be much larger than in that year.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Although building construction is expected to increase substantially compared with 1939, construction which utilizes pickets and palings might not increase proportionately. The value of consumption and production of pickets might be 10 to 20 percent greater than in 1939. Consumption, therefore, might range from 2.7 to 3.0 million dollars and production from 2.5 to 2.7 million dollars. Imports may also be greater in value in about the same ratio to 1939, say approximately \$285,000 (foreign value).

Per capita income 75 percent higher than in 1939.

Residential building would presumably increase considerably at a higher level of income, and pickets for fences would probably be in greater demand. Consumption and production might be 25 to 35 percent greater in volume than in 1939. The price of pickets might be 20 percent higher than in 1939, and the value of consumption and production 50 to 60 percent greater. The value of consumption under these conditions would probably be about 3.7-4.0 million dollars and that of production 3.4-3.6 million dollars. The foreign value of imports might be greater in similar proportions and reach about \$385,000.

Exports

Export statistics do not show pickets, or palings, separately, but indications are that exports are negligible, as compared with production and imports.

Employment

Pickets are only one of a number of products manufactured at saw-mills, planing mills, or retail lumber yards, and no data are available concerning the number of wage earners engaged in their production.

RATTAN (UNMANUFACTURED)

Tariff paragraph: 1806.
Commodity: Rattan, unmanufactured.
Rate of duty: Free.

GENERAL

Data on United States imports for 1939 and 1937 are given below:

Item	Imports ¹ (apparent consumption)
1939	
Quantity (1,000 pounds).....	5,165
Value (\$1,000).....	1,398
Unit value (per pound).....	\$0.081
1937	
Quantity (1,000 pounds).....	7,719
Value (\$1,000).....	1,879
Unit value (per pound).....	\$0.049

¹ Less reexports which were negligible.
² Foreign value.

Rattan is a tree-climbing palm, resembling a vine, which is native to the Malay Archipelago, Ceylon, and Burma. It may be used whole (or unprocessed), or converted into reed, cane, and cane webbing. In these various forms it is adaptable to many uses, including its use as the principal material in rattan and reed furniture, and for seats, backs, spline, molding, and other purposes in general furniture; for material to cover seats in public vehicles; for baskets, trays, and bags; walking sticks and umbrella handles; snow plows, street sweepers, and brooms; stock whips, ship fenders, and numerous other uses. During the war it has been restricted to essential uses, including ship fenders, wheel chairs, military hat bands, and in occupational therapy.

Other materials used for similar purposes tend to limit the demand for rattan. Furniture made of wood, metal, or plastic is used for the same purposes as rattan and reed furniture; imitation leather or other synthetic fabrics are used to cover car seats in place of cane webbing; and plastic webbing materials can also be substituted for cane webbing in some uses.

Although rattan grows wild, extensive organization is required for its collection in jungles, assembling and moving it to interior and coastal depots, and its transfer to principal collection centers for cleaning, sorting, and grading for export markets. Its collection probably has not been wholly abandoned during occupation of the producing area by the enemy, but the extensive system necessary to maintain stocks for international trade in all likelihood has been disrupted.

Rattan is not found in the United States, but reed, cane, and cane webbing are produced here from imported raw material. Imports come predominantly (75 percent or more) from the Netherlands Indies, with smaller quantities from British Malaya, China, Hong Kong, and the Philippines. Since 1941 imports have been cut off, except for relatively small shipments from Africa which were not of standard grades.

Imports in 1939 were smaller than usual. In the preceding table imports for 1937 are also shown, but they were somewhat above the average for the 5-year period, 1936-40, which amounted to about 6,750,000 pounds. Actual consumption in 1939, including withdrawals from stock, was probably substantially larger than the imports of that year.

The consumption of unmanufactured rattan in the United States (and consequently the imports thereof) depends on the combination of two factors: (a) The demand for furniture wholly or partly of rattan and (to a less extent) the demand for other products made of or containing rattan, and (b) the proportion of that demand supplied by imports of semimanufactured rattan (cane, reed, and cane webbing) and of finished articles of rattan (furniture and other products).

Unmanufactured rattan is duty-free but the imports of this material are to some extent affected by variations in the imports of the semi-manufactures and finished manufactures of rattan. These products are dutiable (except from the Philippines) and a change in the duty might affect the imports appreciably, and thus affect the domestic production of the corresponding articles from imported raw rattan.

During the 5 years, 1936-40, the average annual value of imports of unmanufactured rattan was \$349,000, while the average value of the

semimanufactures and finished manufactures of rattan, bamboo, and osier or willow was \$301,000 from the Philippine Islands, and \$457,000 from other countries, the greater part of which consisted of products of rattan.

POST-WAR SHORT TERM

Increased production of furniture on account of postponed demand will be likely to create a demand for rattan and its derivatives in excess of the supply. With imports from the principal sources cut off since late 1941, the stocks in the United States probably are near exhaustion. Exports from the Far Eastern sources may be resumed to some extent within a short time after the liberation of these areas, but it is not probable that for some years the collecting and exporting organizations can be fully reorganized so that exports can reach normal levels. Imports of unmanufactured rattan (as well as of the advanced products) into the United States are therefore likely to be considerably lower than the average for the period 1936-40.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Domestic production of furniture (of wood or other materials) under this assumption would probably be about 10 percent greater than in 1939, by reason of increase in population. Whether the production of furniture containing rattan would increase correspondingly is uncertain; this would depend on both style factors and the possible substitution of other materials in place of rattan and of wood furniture in general. The other uses of rattan are subject to more or less similar causal influences. It seems fairly probable that the total consumption of rattan, in whatever form imported, may be no greater than in normal pre-war years, other causes tending to offset those of increased population. If at the same time the proportion of imports consisting of unmanufactured rattan should be about the same as before the war, the imports of the raw material would presumably be about equal to the average for 1936-40, namely 6,750,000 pounds. The price would probably be about the same as in 1939, which would give a foreign value of imports of unmanufactured rattan of about \$340,000.

A 50 percent reduction in the rates of duty on semimanufactures and finished manufactures of rattan might cause a significant increase in the imports of these articles¹ and result in lessening the imports of the crude product by perhaps 10 to 15 percent; the quantity might thus be about 6 million pounds, with a value of about \$300,000. Conversely, a 50 percent increase in the rates of duty on semimanufactures and manufactures might increase the imports of unmanufactured rattan by 10-15 percent, so that the quantity might reach 7.5 million pounds, with a value of \$375,000.

Per capita income 75 percent higher than in 1939.

Consumption of furniture in general, particularly in terms of value as distinguished from number of articles, is decidedly affected by changes in national income. The same is true, though perhaps to

¹ That is of imports, which are dutiable from countries other than the Philippines. No forecast is offered regarding imports from the Philippines (hitherto duty-free), which, dependent on their status at that time, may or may not be affected by changes in duty. See section on furniture of rattan, etc., page 519.

somewhat less extent, of the consumption of other articles into which rattan enters. On the other hand, with high national income there might be more substitution of other materials for rattan, and for wood furniture in general, than would occur with an unchanged income. It may be roughly estimated that, in the absence of a change in the duties on the semimanufactured and finished rattan products, the imports of rattan might, under this assumption regarding income, be 15-25 percent greater than the average for the pre-war period, and might amount to about 8.5 million pounds. The price of rattan would presumably increase somewhat; if the increase should be about 10 percent over the 1939 figure, the value of imports would be about \$470,000.

Following the methods of calculating already presented, a reduction in the rate of duty on rattan derivatives might cut down the imports of unmanufactured rattan from the above figure to 7.5 million pounds, with a value of perhaps \$410,000. An increase in these duties might raise these imports to about 9.5 million pounds, with a value of about \$520,000.

BAMBOO

Tariff paragraph: 1806.
Commodity: Sticks of bamboo.
Rate of duty: Free.

GENERAL

United States imports¹ (apparent consumption) for 1939 had a foreign value of \$268,000.

Sticks of bamboo, in the rough or not further advanced than cut to length, were imported into the United States before the war in the value of about \$250,000 annually. These sticks are utilized for fishing poles and rug poles, and in the manufacture of fishing rods, ski and vaulting poles, sunshades, parasols, walking canes, and similar products. Small quantities are used in furniture, novelties, and toys. Japan was the principal source of bamboo imports before the war, although China, British India, and other countries supplied smaller volumes. Bamboo is not produced in commercial quantities in the United States.

POST-WAR SHORT TERM

It is probable that the consumption of articles of bamboo will be substantially increased in the post-war years. Greater demands for sporting goods, particularly fishing rods and poles, used in physical rehabilitation programs and for recreational purposes, might be important factors. Also a larger consumption of rug poles, sun shades and similar commodities will probably be associated with the building and furnishing of homes. Although imports of finished articles of bamboo might be greater, it is probable that domestic production of such articles and, therefore, the importation of sticks of bamboo, will also increase. Inasmuch as the price might be considerably higher, the value of imports will probably be much greater than in 1939. It is possible that disruption in the industry caused by the war might

¹ Less reexports which were negligible.

restrict imports, but inasmuch as production consists of little more than cutting and bundling of the bamboo stems, rapid recovery would be expected.

POST-WAR LONG TERM

Per capita income at 1939 level.

The factors which will probably influence favorably the use of bamboo products in the early years after the war will be likely to continue to operate during the long-term period. Consumption might be maintained at a somewhat higher level than in 1939. Prices remaining the same as in 1939, imports might be as much as 20 percent greater than in 1939, or about \$320,000, foreign value.

Per capita income 75 percent higher than in 1939.

With a higher income the demand for sporting goods, household articles, and other commodities made of bamboo would probably be materially greater than at the lower income level. Prices would probably be somewhat higher. The value of imports would thus be about 75 percent greater than in 1939, or approximately \$475,000.

SCHEDULE 5. SUGAR, MOLASSES, AND MANUFACTURES

INTRODUCTION AND SUMMARY

This section includes all items imported under schedule 5 which in 1939 or in any other recent year were valued at as much as \$100,000. These imports had a value of about 135 million dollars in 1939 and accounted for all but a minute fraction of the imports under the schedule. The remaining items consisted of saccharides (rare sugars), sugarcane, dextrose sirup, and a few other items, the total value of which in 1939 was less than \$17,000. None of these remaining items have been imported in recent years, or are likely to be imported in the future, in quantities that are significant in relation to total imports under schedule 5 or domestic production of similar goods.

There are no free-list items closely related to those covered by schedule 5 of the Tariff Act, but a substantial part of the imports under the schedule were entered duty-free from the Philippine Islands. These duty-free imports in 1939 were valued at about 50 million dollars, accounting for more than one-third of the total value. The great bulk of the remainder were from Cuba and were therefore dutiable at rates lower than those applicable to imports from countries subject to the general United States tariff.

In 1939 imports of raw and refined cane sugar, which are covered by the first of the following comments, had a foreign value of almost 125 million dollars, accounting for more than 90 percent of the total foreign value of imports under schedule 5. In some pre-war years, mainly on account of considerably larger imports of inedible molasses, the imports of dry sugar represented a somewhat smaller proportion of the total. In all years, however, dry sugar accounted for by far the greater part of the imports under schedule 5 and will undoubtedly continue to do so in the future. Consequently the estimates for future imports in this section are dominated by the outlook for the trade in dry sugar.

United States production and imports of sugar, moreover, in recent pre-war years were influenced primarily by the quota system, which was applied first under the Jones-Costigan Act of 1934 and later under the Sugar Act of 1937. Under this quota system, import duties have not been a controlling factor on prices of sugar in United States markets, or on the share of consumption supplied by the several areas, domestic or foreign. Tariff treatment, however, had considerable influence on the foreign value of Cuban and Philippine sugar imported into the United States. The quota system has been suspended as an emergency measure during the war, but the estimates called for by Senate Resolution 341 have been made under the assumption that,

when normal peacetime conditions return, sugar quotas will again be in effect.

Trade relations of the United States with the Philippine Islands are of considerable importance to the import trade in sugar. In the immediate pre-war years the Philippine Islands supplied about one-third of total United States imports of sugar and about one-seventh of total United States sugar consumption. The Sugar Act of 1937 provided for a quota on imports of Philippine sugar in about those ratios to total imports and to total United States consumption. If, however, Philippine sugar should become dutiable at the general rates, as the present provisions of the Philippine Independence Act provide, and if the general rates of duty be those of July 1, 1939 (which were much higher than those now in effect), it is doubtful whether the Philippine Islands would supply much if any sugar to the United States. Thus, in estimating future imports, it has been assumed, not that the present allocations under the Sugar Act of total imports among Cuba, the Philippine Islands, and other foreign countries would be retained, but that the quota system would be applied so as to be no more restrictive of total imports than it was on July 1, 1939.

On account of the large proportion of imports under schedule 5 which have been and will probably continue to be accounted for by dry sugar, the assumptions made as regards the future of the quota system are far more important to the estimates of future imports and domestic production than any other consideration. If the quota system were abolished or substantially modified the estimates and the whole outlook for United States imports and production of sugar would be greatly changed.

The rates of duty on imports of Cuban sugar on July 1, 1939, were less than half the rates (general rates) on imports from full-duty countries. This situation resulted from the trade agreement with Cuba, effective September 3, 1934, in which the duties on imports of Cuban sugar were reduced without comparable reduction of the general rates. However, the Cuban preferential rates had usually been only 20 percent less than general rates, and after the agreement of 1942 with Peru the Cuban preferential on sugar again became 20 percent. It seems probable that in the long-term period the percentage of preferential tariff treatment of imports of Cuban sugar will be less than it was in 1939. The analysis of the prospects for the future trade in sugar must, however, under the terms of Senate Resolution 341, be based on the same ratio between the Cuban and general rates as that which existed on July 1, 1939.

Only two items in schedule 5—maple sugar and sirup, and sugar candy and confectionery—are not closely related in their production to the main sugar industry, and the imports of the two accounted for less than 2 percent of the total imports under the schedule. The remaining imports covered by schedule 5, on which separate comments follow, are liquid sugar, edible molasses, and inedible molasses, and these are coproducts or byproducts of the sugar industry.

Estimates of post-war production (for the domestic market) and imports of the commodities covered in this section have been totaled. (Wherever a range of estimates is given in the text, the midpoint of the range has been taken for purposes of tabulation.) These estimates are compared below with actual production (for the domestic market) and imports in 1939:

Period, income level, and tariff treatment	Production for domestic market		Imports	
	Value	Ratio to 1939	Foreign value	Ratio to 1939
	Million dollars	Percent	Million dollars	Percent
1939 <i>Sugar, molasses, and manufactures, dutiable</i>	680.7	100	133.1	100
Imports ¹ from—				
Philippine Islands duty-free			49.6	
Cuba dutiable at preferential rates			79.3	
Other countries dutiable at general rates			6.2	
Post-war long term:				
Per capita national income same as in 1939:				
Duty as in 1939	680.7	100	133.9	119
Duty reduced by 50 percent	680.7	101	178.1	137
Duty increased by 50 percent	671.5	100	133.0	98
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939	945.0	160	238.3	178
Duty reduced by 50 percent	940.7	149	204.3	159
Duty increased by 50 percent	947.6	160	198.4	155

¹ This figure includes about 7 million dollars worth of imported sugar for processing and reexport. The value of schedule 5 imports for consumption in the United States in 1939 thus was 126 million dollars. The estimates for post-war imports of sugar are for consumption in the domestic market only, and therefore the percentages for imports, under the various conditions, relative to those in 1939 are based on 126 million dollars rather than on 133 million.

² Imports of sugar "for direct consumption," rather than for further processing, were subject to an import compensating tax which was collected by the Customs Service as a duty. This tax is not taken into account here in reporting all of the imports from the Philippine Islands free of duty. This special import tax puts imports for direct consumption on the same basis as sugar sold by domestic refineries on which an excise tax is collected.

The estimates of quantities and values of imports and domestic production of individual commodities under the various assumptions as to national income and levels of duty are subject to considerable, frequently wide, margins of error. Because of the predominance of dry sugar among the items covered by schedule 5, the margins of error, in view of the assumptions made as to the future quota control of sugar, are attributable mainly to uncertainties as to the volume of United States consumption, and the future price of sugar. In addition, considerable uncertainty is involved in the estimates of the volume of consumption of inedible molasses, the second most important item of imports in schedule 5. This uncertainty arises principally as to the demand for industrial alcohol and the extent to which molasses may constitute the raw material for its production in the future. In the other less important items of the schedule, of course, there are the usual indeterminate influences on the volume of consumption and the competition between foreign and domestic production.

SUGAR, CANE AND BEET

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
501	Sugar, cane and beet:		
	General rate	1.284375¢ per lb. + 0.028925¢ per lb. for each sugar degree over 75 (= 1.875¢ on 96° sugar, 1.9875¢ on 100° sugar).	134%.
	Cuban sugar	0.6165¢ per lb. + 0.0135¢ per lb. for each sugar degree over 75 (= 10.9¢ on 96° sugar, 0.954¢ on 100° sugar).	51%.
	Philippine sugar, up to 850,000 long tons of which 50,000 may be refined (excess shipments subject to the general rate).	Free.	

NOTE.—See subsection on tariff history in text.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production (for domestic market)	Imports	Exports ¹	Net imports	Apparent consumption	Ratio of imports to consumption
Quantity (refined basis) (1,000 short tons)	3,864.4	2,763.3	124.6	2,628.7	6,483.1	Percent 40.5
Value (\$1,000) (partly estimated)	298,436	124,544	6,984	117,560		
Unit value (cents per pound)	3.871		2.804			
Persons employed in factories and refineries	42,800					
Number of farms producing cane or beets, including those in Puerto Rico and Hawaii	73,674					

¹ Represents mainly exports, with benefit of draw-back, of refined sugar made from imported duty-paid raw sugar.

² These values are exclusive of the excise tax of 0.534 cent per pound. This tax, therefore, must be added to the unit value shown in order to approximate wholesale price quotations on refined sugar.

³ Foreign value.

⁴ The mainland cane sugar refineries generally process imported cane sugar along with raw sugar produced from Puerto Rican, Hawaiian, or mainland cane.

The figures given above for quantities and values of domestic production are of the refined sugar recoverable from the 1939 sugar-beet and sugarcane crops of continental United States and Puerto Rico and Hawaii. They do not include the production of refined sugar from imported raw sugar. The imports include both raw and refined sugar, but for many years have consisted mainly of raw sugar for refining in this country. In preparing the table the quantities of raw sugar imported were converted to their refined sugar equivalent to give a single total for the imports corresponding to that for the refined sugar derived from domestic sugar crops. The unit values of the raw and refined sugar imported differed considerably. The foreign values of imports from different sources also varied on account of their respective tariff treatment on importation into the United States. The quantities, values, and unit values of imports from different

sources, distinguishing raw and refined sugar, are shown in the table below.

*Cane sugar, raw and refined:*¹ *United States imports for consumption, by principal sources, 1959*

Country and Item	Raw			Refined	Total ²	Total, refined equivalent ³
	96°	Other	Total			
Cuba:						
Quantity (1,000 tons).....	1,114.8	436.4	1,550.9	321.3	1,872.2	1,784.8
Foreign value:						
Total (\$1,000).....	41,067	16,577	57,634	16,137	72,771	
Unit (cents per pound).....	1.84	1.90	1.86	2.30		
Philippine Islands:						
Quantity (1,000 tons).....	792.9	102.8	895.4	55.9	951.3	896.8
Foreign value:						
Total (\$1,000).....	39,966	5,507	45,473	4,144	49,617	
Unit (cents per pound).....	2.82	2.69	2.54	3.71		
Other⁴ (full-duty):						
Quantity (1,000 tons).....	71.4	.4	71.8	5.2	77.0	72.3
Foreign value:						
Total (\$1,000).....	2,013	16	2,029	137	2,166	
Unit (cents per pound).....	1.41	2.26	1.41	1.31		
Total:						
Quantity (1,000 tons).....	1,978.8	539.3	2,518.1	382.4	2,900.5	2,783.3
Foreign value:						
Total (\$1,000).....	83,036	22,100	105,136	19,418	124,554	
Unit (cents per pound).....	2.10	2.05	2.09	2.54		

¹ Imports of beet sugar were insignificant.

² Representing simply the aggregate of sugars imported, pound for pound, without adjustment for difference in polarization.

³ Raw sugar of various tests converted to refined on the basis of 107 pounds of 96° sugar=100 pounds of refined sugar.

⁴ Principally from Dominican Republic and Peru.

Tariff history.

In the analysis of changes in sugar duties, only the rates on refined sugar are specifically stated; when rates other than those applicable July 1, 1939, were in effect, the rates on unrefined sugar were higher or lower than those of that date in the same ratio as those of refined sugar.

The Tariff Act of 1930, as originally enacted, provided for a general rate of 2.65 cents per pound on 100° sugar, with rates per pound on raw sugar graded downward by 0.0375 cent per degree. The then existing Cuban preferential (20 percent below general rates) resulted in a rate of 2.12 cents on 100° sugar from Cuba, with the downward gradation on raw sugars of 0.03 cent per degree. On June 8, 1934, the duties on sugar were reduced 25 percent by Presidential proclamation under section 336 of the tariff act, resulting in rates of 1.9875 cents per pound on refined sugar subject to the general rate of duty and, by virtue of the 20 percent preference, to 1.59 cents per pound on sugar from Cuba. The duties on Cuban sugar were further reduced by 40 percent (giving 0.954 cent per pound for 100° sugar) by the trade agreement with Cuba which became effective on September 3, 1934. The general rates were not affected by the agreement with Cuba and the rates on Cuban sugar thus became less than half the general rates.

Before establishment of the Philippine Commonwealth in accordance with the provisions of the Philippine Independence Act, sugar from the Philippines had been imported free of duty in unlimited quantities. During the Commonwealth period of approximately 10½ years, ending July 4, 1946, the Independence Act as amended provides for an annual duty-free quota of Philippine sugar of 850,000 long tons,

of which not more than 50,000 long tons may be of refined sugar. The total duty-free quota is equivalent to approximately 916,000 short tons in terms of refined sugar.¹ Imports from the Philippines in excess of this quota are subject to the full general rates of duty.

The foregoing paragraphs explain the tariff treatment of sugar in effect July 1, 1939, but important changes have since been made. The first of these had to do only with the duties applicable to Cuban sugar during the latter part of 1939. The trade agreement with Cuba of 1934 provided that the reduced rates (0.954 cent for 100° sugar) were to be applicable only during the existence of a quota system similar to the one in effect at the time the agreement was signed. The quota system was suspended on September 11, 1939, as the result of events caused by the outbreak of the European war, and the duty on Cuban sugar reverted to the pre-agreement rate (1.59 cents for 100° sugar). By a supplementary agreement with Cuba, however, effective December 27, 1939, the rates on Cuban sugar provided for by the 1934 agreement (0.954 cent per pound for 100° sugar) were restored, and on January 1, 1940, the quota system was resumed.

In a subsequent trade agreement with Cuba, effective January 5, 1942, and one with Peru, effective July 29, 1942, the rates on sugar were reduced to 50 percent of those established by Presidential proclamation in June 1934; that is, to 0.795 cent per pound on 100° Cuban sugar and 0.99375 cent per pound on sugar from other foreign countries. For the duration of these agreements the rates stated are to apply whether or not a quota system is in effect.

The quota system.

The conditions in the United States sugar industry and trade in 1939 were in large part attributable to the Sugar Act of 1937, which, with amendments, is still in effect, and superseded somewhat similar legislation of 1934, the Jones-Costigan Act.

The Sugar Act does not affect rates of duty but provides for the imposition of quantitative restrictions on imports and also on the marketing of domestic sugar. The President is authorized in case of emergency to suspend these restrictions; in the absence of suspension the Secretary of Agriculture is directed to determine the quantity of sugar needed for each calendar year to meet the requirements of consumers in continental United States. The Act provides that the quantity so fixed shall not be so small as to result in prices excessive to consumers or higher than necessary to maintain the domestic sugar industry as a whole. Portions, specified in the Act, of requirements are to be the quotas on the permissible marketings from different sources of supply.

The initial quotas for all domestic sources taken together are, under the Sugar Act, ordinarily to be 55.59 percent, and the quotas for all foreign sources combined make up 44.41 percent of the total requirements. The Act provides, however, that the combined quotas for domestic sources are not to be less than 37 million short tons expressed in terms of 96° sugar (equivalent to about 3.5 million short tons in terms of refined sugar), and that, if 55.59 percent of the total requirements is less than this amount, the combined quotas for foreign sources are to be the balance of the requirements over the

¹ Because of the varying purity of raw sugar, quantity of refined Philippine sugar obtainable from duty-free imports of raw sugar is not constant from year to year.

minimum domestic quota. Of the total for domestic sources 41.72 percent is to be the quota of the mainland sugar-beet-growing areas; 11.31 percent, that of the mainland sugarcane-growing areas; 25.25 percent, that of Hawaii;² 21.48 percent, that of Puerto Rico;² and 0.24 percent, that of the Virgin Islands. The total quota for foreign sources is divided as follows: 34.70 percent for the Philippine Islands, but not less than the duty-free quantity provided for in the Independence Act; 64.41 percent for Cuba; and 0.89 percent for other foreign countries.

Provision is made for adjustment of the initial quotas to meet current changes in consumption, and also for the adjustment of the area quotas and for reallocation of the amounts by which particular areas fail to supply their full quotas. Any deficiency of Philippine shipments is to be allocated among foreign sources other than Cuba. In the event that any domestic area or Cuba fails to supply its quota the deficit is to be allocated among the other areas in this group (domestic areas and Cuba).

When the quota system is in effect, the Act also provides for protection of the continental sugar-refining industry against increased deliveries of refined sugar from Cuba, the Philippine Islands, Puerto Rico, and Hawaii. The maximum portions of the quotas of these areas which may consist of refined sugar are, like other quantities referred to in the Sugar Act, expressed in terms of 96° sugar. The approximate refined sugar equivalents of the specified amounts are as follows: For Cuba, 350,000 short tons; for the Philippine Islands, 76,600 short tons;³ for Puerto Rico, 118,000 short tons; and for Hawaii 28,000 short tons.⁴

The United States sugar industry and trade was regulated by the quota provisions of the Sugar Act from 1937 through the first 8 months of 1939; it had previously been regulated since 1934 by somewhat similar arrangements under the Jones-Costigan Act. The quota system was, however, suspended on September 11, 1939, by executive action owing to the high prices of sugar caused by unusually large purchases following the declaration of war in Europe. With suspension of the quotas the marketings from domestic sources increased considerably, but a similar increase did not occur in imports from Cuba, partly because of the return to the higher rates of duty; this accounts for the fact that, in the year 1939 as a whole, sugar from domestic sources supplied a larger, and that from foreign sources a smaller, proportion of total consumption than the quota arrangements would have maintained. In this respect the statistics for the year

² The consumption requirements of Puerto Rico and Hawaii are separately determined, but those requirements are minor in relation to the shipments of these areas to the mainland. The requirements of these off-shore areas are to be supplied entirely by local production and do not affect the quotas, subsequently discussed, on the marketings to the mainland.

³ The duty-free quota under the Independence Act for Philippine refined sugar is 50,000 long tons, which is equivalent to 80,000 short tons. The Philippines have not ordinarily shipped refined or raw sugar to the United States in excess of the amounts duty-free under the Independence Act.

⁴ Some additional sugar is imported as "liquid" sugar at slightly lower rates of duty than those applicable to dry sugar. These imports are limited to a quota equivalent to about 35,000 short tons of refined sugar. Liquid sugar, as opposed to other sugar syrups and molasses, consists of sugar solutions in which at least 94 percent of the soluble solid content is sugar. Other syrups and molasses are used in ways for the most part different from those of dry sugar. The use of liquid sugar to replace dry sugar in the production of bakery products, confections, and ice cream has expanded considerably in recent years. Some sugar is marketed in liquid form by domestic refineries but this need not be taken account of in the analysis of the total sugar supply under the quota system, since whatever is so marketed by domestic refineries comes out of a total limited by the quota arrangements discussed. Thus only the liquid sugar imported in that form is an addition to the total sugar supply, and these imports as limited by quota constitute only a little more than one-half of 1 percent of the total. These imports are considered in a separate report. (See Liquid Sugar, paragraph 502.)

1939 do not accurately indicate the operation of the controls provided for by the Sugar Act.⁶ The figures for consumption in 1939 given at the beginning of this section however, are only slightly higher than the average consumption of pre-war years.

The quota system was restored at the beginning of 1940 but as a result of United States entry into the war and particularly of the interruption of shipments from the Philippine Islands, the quota system was again suspended in April 1942, and to this date (May 1945) it has not been restored.

Cuba has long supplied the bulk of the imports into the United States of dutiable sugar, and before the introduction of the quota system the price of sugar in United States markets was ordinarily above the export price in Cuba and in other large sugar-exporting countries by about the amount of the duty on imports of Cuban sugar. Under the quota system this price relationship was eliminated; the United States price⁶ was determined by consumer demands for the supply as restricted by the quota system, and this price was regularly above "the free world price" by more than the duty and delivery charges on imports from Cuba.

As a result of the United States quota system the sugar trade was so organized in Cuba that, notwithstanding the fact that Cuba exported sugar to markets other than the United States, the producers in that country obtained on permissible deliveries to this market the United States price minus the duties payable and delivery charges. There probably would have been an incentive for similar organization of the trade in countries whose contributions to the United States sugar supply are subject to general rates of duty, if the United States price had been above the world price by more than the amount of the general rates of duty. This situation, however, did not regularly appear, and frequently these countries did not realize on their sales in the United States higher prices than on deliveries to other markets; in fact, the full-duty countries sometimes did not supply their full quotas.

Under the quota system the rates of duty on sugar ceased to be a critical factor in determining the level of sugar prices in the United States or the volume of imports or domestic production. Moreover, not only the domestic (continental and insular) and Philippine producers but also the Cuban producers obtained higher prices on their deliveries to the United States than they would have obtained in the absence of the system. The primary importance of the rate of duty on Cuban sugar under these circumstances was that it determined the division of the United States market value⁷ of the Cuban deliveries between the Cuban producers and the United States Treasury.⁸

⁶ In two other respects the statistics at the beginning of this report are not perfectly appropriate for an analysis of the quota system. In the first place, the figure given for domestic production is for the refined sugar recoverable from the 1939 cane and beet crops, while the quotas refer strictly to the permissible annual marketings, which may in any particular year be quite different from production. In addition, the figure for apparent consumption includes consumption of Puerto Rico and Hawaii, while the requirements from which the main quotas are determined are those of continental United States only.

⁷ The United States price here referred to was exclusive of the excise tax, which was levied on sugar during most of the period when the quota system was in effect. The price to consumers, of course, included this tax.

⁸ Exclusive of the processing tax later described, which under the Sugar Act is levied on all sugar marketed in the United States.

⁹ If the general rate of duty had been materially lower, or if the spread had come to be greater between the United States market price and the free world price, the general rate of duty might have had a similar relation to the price yielded to producers in full-duty countries on deliveries to this market.

Benefit payments.

The Sugar Act also imposes a tax of 53.5 cents per 100 pounds, refined sugar basis, on all sugar marketed in the United States,⁹ and provides for benefit payments to domestic (continental United States, Puerto Rican, and Hawaiian) growers of sugarcane and sugar beets. The eligibility of individual growers to receive benefit payments is conditioned on, among other things,¹⁰ their confining their production of sugarcane or sugar beets to such amounts (or acreage) as may be determined in the allocation of the quotas for domestic sources. The benefit payments in 1939 were at the rate of 60 cents per 100 pounds of recoverable raw sugar, on production up to 500 short tons by any individual grower; on production in excess of 500 short tons the rate of benefit payments was scaled downward, the minimum rate being 30 cents per 100 pounds on any quantity exceeding 30,000 short tons.¹¹ These benefit payments represent advantages to the domestic producers of sugar, additional to the spread between prices of domestic and foreign sugar, attributable to the restriction of imports of sugar by quota.

The Philippine Independence Act.

The Philippine Independence Act provides that the Philippine Islands shall become a sovereign state not later than July 4, 1946, and that thereafter Philippine products shall be subject to the same rates of duty as the products of foreign countries generally. Application of the 1939 general rates, or even of substantially lower rates, may render resumption of Philippine exports of Philippine sugar to the United States, on anything like the pre-war scale, unprofitable. However, the Independence Act provides for further consideration of the future trade relations between the United States and the Philippine Republic and in June 1944 Congress authorized the establishment of a Filipino Rehabilitation Commission to consider, among other things, these trade relations.

The following analysis of the post-war prospects for United States production and imports of sugar, however, necessarily is based on the assumption that in post-war years the general rates of duty will be applicable to imports of Philippine sugar. Should other arrangements be made whereby Philippine sugar would receive, for a period of years, tariff treatment more favorable than it would under existing legislation, some of the estimates made below might need revision.

United States exports.

The exports of sugar shown in the statistics at the beginning of this report are virtually all of refined sugar exported with benefit of draw-back. Under the administration of the Sugar Act the raw sugar imported for refining and subsequent export is not charged against the quotas of sugar marketed in the United States for final consumption. The exports in 1939 represented more than 2½ percent of the total cane sugar refined in the United States. Although this was a somewhat

⁹ The tax is levied at the refinery on sugar refined in the United States, whether from imported or domestic raw sugar. On imports of refined sugar, the tax is collected by the Customs Service.

¹⁰ The other conditions have to do with the growers abiding by certain standards of wages, child labor, and soil conservation.

¹¹ The benefit payments were increased to smaller growers by an amendment of the Sugar Act in 1940 and in later years have ranged from 80 cents per 100 pounds down to 30 cents.

In addition, beginning with 1943, incentive payments have been made to offset the increased costs of producing sugar-bearing crops caused by wartime developments. These payments are given per ton of sugar beets and sugarcane and vary with the sugar content and from year to year. For the sugar-beet crop in 1944 they were equivalent on the average to about 85 cents per 100 pounds of recoverable sugar; for the mainland cane crops, to nearly 80 cents per 100 pounds of sugar; and for the Hawaiian and Puerto Rican cane crops, to about 20 cents per 100 pounds.

larger figure than the average for recent pre-war years, the refining of foreign sugars for export was in those years of considerable importance to the United States cane-sugar-refining industry. Possibly in the few years after the war, while refining capacity is being restored in some of the European countries and while shipments of sugar to foreign countries for relief purposes may be substantial, this business of refining for export may be considerably larger than in the 1930's. Since, however, the United States, in the future as in the past, will undoubtedly be on a substantial net import basis as to raw and refined sugar taken together, it is improbable that exports of refined sugar will be of any appreciable importance to the domestic producers of sugar crops. Moreover, since there was a fairly rapid development of refining capacity in the tropical cane-growing areas in the inter-war period, and since this development may well continue in the future, it is possible that the refining in the United States of imported raw sugar for export will be less important in the future than in the immediate pre-war years. The main analysis following, therefore, has to do entirely with the production and imports of sugar for final consumption in the United States.

POST-WAR SHORT TERM

The quota system and the prospects for the United States sugar trade after the war.

Immediately after the war there may well be shortages in world supplies of sugar rather than surpluses such as in the decade before the war. In the Philippines it would probably take a few years to restore production to pre-war levels, even if sugar production should offer as favorable employment for Philippine resources as formerly. In Java and other former sugar-exporting areas of the Orient which have been under Japanese control, similar uncertainty exists as to productive capacity in the immediate post-war years; also in the beet-sugar-growing areas of Europe production is likely to be below pre-war levels for at least a few years. The pre-war level of consumption in war-torn areas may be possible only if outside financial assistance is given and if there is rapid restoration of economic activity. However, it appears probable that in the short term the prices of sugar in free world markets may be substantially higher than before the war. The situation, therefore, may not be such as to render necessary the resumption of quota controls in the post-war short-term period, and the following estimates of sugar production and imports are made on that assumption.

Consumption requirements of the United States in the immediate post-war years might be 8-12 percent higher than in 1939, say, 7.0-7.5 million short tons. Taking all uncertainties into consideration, the most reasonable expectation is that all domestic areas combined might produce in the short-term period at about the level of 1939, say, 3.7-4.0 million short tons, refined basis. This would leave a balance of 3.0-3.5 million short tons to be supplied by imports, which would come mainly from Cuba.

POST-WAR LONG TERM

Assumption regarding the future of the quota system.

The Sugar Act of 1937 providing for quota control of both domestic production and imports of sugar would, in the absence of further action

by Congress, expire at the end of 1946. Such control, however, has been provided for by legislation since 1934, and the present Act has already been extended three times with amendment only in detail. The policy represented by the Act, therefore, including arrangements which would maintain United States production of sugar at the levels contemplated by the Sugar Act—if necessary by quantitative restriction of imports—will presumably continue to be a policy of this Government independent of the tariff treatment it accords to imported sugar. Moreover, it is highly probable that, under any of the levels of duty to be considered in responding to Senate Resolution 341, the duties on imports of Cuban sugar would not, in the absence of quantitative restriction, keep total imports within the limits set in the Sugar Act or maintain prices to United States producers in the measure contemplated by that Act. In analyzing the relation of different levels of duty to the volume and value of United States imports of sugar in the post-war long term, therefore, it is assumed that the quota system will be restored. For reasons later to be explained, however, it seems inappropriate to assume that the present provisions of the Sugar Act regarding the allocation of imports among different foreign sources (the Philippines, Cuba, and other foreign countries) will be maintained.

In many ways the assumption of a return of the quota system simplifies the problems of making the estimates called for in the Senate resolution. In the first place, a corollary of the assumption is that the spread between the price of sugar in United States markets and the free world price will not be directly controlled by the rates of duty applied to imports, but will be determined primarily by the quotas.¹² Another corollary of the assumption is that imports will consist in about the same proportions of raw and refined sugar as in pre-war years.

One complication in making estimates of post-war imports arises out of the change in the tariff treatment of Philippine sugar which will occur under existing legislation. It is not probable that the Philippines would supply much, if any, of the quota which would be initially allotted them under the present provisions of the Sugar Act, if Philippine sugar becomes dutiable at the general rates. Moreover, under the present provisions of the Sugar Act, any amount by which the Philippines fall short of supplying their quota (usually something more than 916,000 tons, refined basis) is to be reallocated to foreign countries other than Cuba. With the general rates of duty as of July 1, 1939, it is doubtful that full-duty countries would in fact supply a substantial part of the Philippine duty-free quota. Thus the present quota regulations of the Sugar Act, if unmodified, in conjunction with the changed tariff status of Philippine imports would (with duties as of July 1, 1939) be more restrictive of total imports than they were in pre-war years.

The estimates below are based on the assumption that provisions of the Sugar Act would be so modified as to permit imports in about the same ratio to total United States requirements as contemplated under the existing law. This modification would probably increase the quota of Cuba to the extent by which imports from other foreign sources, including the Philippines, failed to attain the volume contemplated under the present provisions of the Act.

¹² The United States prices here referred to are the prices realized by the United States producers of sugar, not the prices paid by consumers, which include excise taxes

The assumptions herein made as to the future application of the quota system are not to be understood as a prediction of what will actually occur, or as indicative of what the Commission might consider appropriate policy. The Commission is not undertaking to forecast the legislation which the Congress will enact. Congress may or may not continue a quota system of the type in existence before the war, or it may continue the system but may change materially the allocation of quotas to the several domestic and foreign sources. However, the Sugar Act is still the law and the Commission has assumed that it will continue to be. If the quota system should be greatly modified or entirely abandoned, the ratios of imports to domestic production, under the several assumptions regarding rates of duty, would be decidedly different from those herein estimated. Estimates on such an assumption, however, would be subject to an extremely wide margin of error and no such estimates are made in this report.

On the assumption that the quota system to be applied would be no more restrictive of total imports¹³ than it was in immediate pre-war years, the only effect of various levels of duty would be on the foreign value of the imports. These values would probably be, as they have been in the past under the quota system, approximately the United States price minus duties and delivery charges on the imports. However, the foreign value of imports from Cuba and full-duty sources would differ considerably, principally on account of the fact that the general rates of duty on July 1, 1939, were a little more than twice those on imports from Cuba. The estimates, therefore, reflect the expectations as to how much of the total imports would, under the various assumptions as to level of duty in the resolution, have to come from Cuba in order that the total imports represent about 45 percent of estimated consumption.

Assumption regarding future Cuban preferences.

Under the provisions of Senate Resolution 341, estimates as to imports in the post-war period must of necessity be based on the relationship between the full-duty rates and the rates on Cuban sugar which existed on July 1, 1939, when the rate on Cuban sugar was less than half of the general rate. However, at most previous times the Cuban preference had been 20 percent, and since the agreement of 1942 with Peru it is now again 20 percent. It seems probable that in the long-term post-war period the preference¹⁴ will not be as it was in 1939, but will be 20 percent. If the duties on imports from Cuba were those of July 1, 1939, and these rates represented only 20 percent preference below the general rates, full-duty countries might supply the bulk of any quotas that were allotted them. Moreover, with duties 50 percent higher than those just referred to, the general rates would be about 10 percent lower than those of July 1, 1939, and there would be the possibility, therefore, of obtaining more sugar from full-duty sources than with the July 1, 1939 rates.

¹³ If some part of any unfilled Philippine quota were to be allocated to domestic production the following estimates of the quantities of imports would be too high.

¹⁴ It is, of course, conceivable that the preference would be eliminated altogether as the result of some multilateral international agreement.

Consumption, Production, and Imports

Per capita income at 1939 level.

Taking into account the 10-percent increase in population to be anticipated by the early fifties it seems probable that United States consumption of sugar, with per capita income at the 1939 level, would be about 7 million short tons (refined basis). This would represent an 8-percent increase over 1939 which was slightly higher than the average for pre-war years. On account of the assumptions already set forth the quantity of domestic sugar production at all levels of duty is estimated at about 3.9 million short tons and the quantity of imports at about 3.1 million.

It is uncertain how labor conditions and increased mechanization of farm operations may affect the costs of producing sugar a decade from now. If, as we are assuming, the policies represented by the Sugar Act are continued, such costs will be relevant to the price which is considered "sufficient to maintain the domestic sugar industry as a whole." Benefit payments are, however, also a feature of the Sugar Act and serve to maintain the returns to domestic producers of sugar. Under these circumstances the appropriate prices on which to base the estimates of the values of domestic production and imports are doubtful. On the whole, and mainly because sugar prices (exclusive of excise taxes) were lower in 1939 than the average for the few years before the war, our estimates are predicated on unit values somewhat higher than those of 1939. With the average unit values realized by United States refineries on their production of refined sugar 5 percent above those for 1939 shown at the beginning of this report, the value of domestic production in the post-war long term with per capita income at the 1939 level is estimated at about 320 million dollars. This estimate would, on account of the assumptions previously explained, be the same for all levels of duty. The rates of duty, however, are relevant to the estimates of the foreign value of imports.

Duties as in 1939.—With duties at such a level and Philippine sugar subject to the general rates, it may well be that only negligible and sporadic deliveries of sugar, if any, would be made from the Philippine Islands or the present full-duty sources. If all the imports came from Cuba they would probably have a foreign value of about 143 million dollars, and the value might be 5 million dollars less if as much as 250,000 tons (probably the maximum to be anticipated) were imported from full-duty sources (including the Philippines).

Duties reduced by 50 percent.—It seems probable that with such duties about the same amounts of sugar, as under the present quota provisions are allocated to the Philippine Islands and present full-duty countries, might be obtained from them and the remainder from Cuba. On that basis the value of imports is estimated at 160 million dollars.

Duties increased by 50 percent.—With such duties probably all the imports would be of Cuban sugar, and imports would have a foreign value of 114 million dollars.

Per capita income 75 percent higher than in 1939.

With this level of income, consumption would probably be in the neighborhood of 7.7 million tons (10 percent more than at the lower-income level) and the value per pound of refined sugar might be about 20 percent higher than with the 1939 level. On this basis the

quantity of domestic production is estimated at 4.3 million tons, the quantity of imports at about 3.4 million, and the value of the domestic production under all levels of duty at about 425 million dollars. Possibly such a volume of domestic production would require some revision of the percentage distribution of the total among the several mainland and off-shore sugar-producing areas.

Duties as in 1939.—Imports would probably have a foreign value of about 215 million dollars if all the imports were from Cuba and possibly 5 million dollars less if as much as 250,000 tons of the imports were obtained from full-duty sources.

Duties reduced by 50 percent.—Imports would probably have a foreign value of about 235 million dollars, imports being shared between full-duty sources (including the Philippines) and Cuba in about the proportions contemplated by the present provisions of the Sugar Act.

Duties increased 50 percent.—Imports would probably all be from Cuba and their foreign value would be about 180 million dollars.

Exports

In the few years immediately following the war, exports, on account of the time it will take to restore refining facilities in the war-torn areas of the world and on account of relief activities, may possibly attain a level of 200,000 tons. Since the exports are likely to consist of refined sugar produced from imported raw sugar and since the raw sugar imported for this purpose is not included in the estimated domestic consumption, the figures for imports would be increased somewhat by these imports. In the long term the exports of refined sugar are more likely to be of smaller than of greater importance than in 1939.

Employment

On the basis of available information as to the average labor required per acre to grow and harvest sugar beets and sugarcane, it is estimated that the 1939 production of domestic sugar crops provided employment equivalent to about 125,000 man-years. The number of persons actually engaged in the production of these crops was, of course, much larger than this because most of the labor was engaged for only part of the year on the production and harvesting of sugar crops. Increased mechanization of operations on sugar-beet and sugarcane farms has occurred in recent years and this trend may be expected to continue after the war. This will tend to decrease the number employed in the production of sugar crops but this decrease would probably be offset in the long term at the 1939 level of income owing to the increased production of sugar; probably agricultural employment in sugar crops would be somewhat greater at the higher level of income considered.

Mainland cane-sugar refineries operate fairly regularly throughout the year, refining both imported and domestic raw sugar, but the beet refineries and the raw-sugar mills of the mainland sugar areas operate only about 3 months of the year. In Puerto Rico and Hawaii the raw-sugar mills usually operate from 6 to 9 months of the year. The number of persons employed in domestic sugar factories and refineries in 1939 was 42,800. Increased production of sugar at the higher income level might increase processing employment possibly from 48,000 to 49,000 persons.

LIQUID SUGAR ¹

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
502.....	Liquid sugar:		
	General rate.....	½¢ per gal. + 0.275¢ per gal. for each percent of total sugar over 48%.	59%.
	Cuban sugar.....	½¢ per gal. + 0.22¢ per gal. for each percent of total sugar over 48%.	40%.

Note.—Under the Tariff Act of 1930 all types of edible molasses and sugar sirups were dutiable at the rates shown above but under the trade agreement program such sirups were separated into two classifications according to the content of nonsugar solids. In the trade agreement with the United Kingdom, effective January 1, 1939, the duties on molasses and sugar sirups containing nonsugar solids equal to more than 6 percent of the total soluble solids were reduced by one-third while the duties on sirups with a 6 percent or less proportion of nonsugar solids, remained at the statutory rates. It is the latter type of sirups which is covered by this section.

In the trade agreement with Cuba, effective January 5, 1942, the duties on all edible types of Cuban molasses and sugar sirups, including the liquid sugar here under consideration, were reduced 50 percent. The reduction of duty under the Cuban agreement did not affect the rates applicable to imports of molasses and sugar sirups from other countries.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports ¹	Appar-ent con-sump-tion ¹	Ratio of imports to con-sump-tion ¹
	Total ¹	For ex-port ¹			
Quantity (1,000 gallons).....			9,276		Percent
Value (\$1,000).....			1,459		
Unit value (cents per gallon).....			15.7		

¹ About 26.1 million gallons of liquid sugar with a value of 9.5 million dollars were marketed in 1939 by domestic refineries. This sugar was probably derived both from domestic and imported raw sugars and was included in the total consumption of cane and beet sugar shown in the main sugar report, par. 501. It would not be appropriate to regard this domestic production of liquid sugar and the employment involved in producing it as additional to the domestic production and employment shown in the main sugar report.

² Data on exports of liquid sugar are not separately reported but they are believed to be small. The bulk of these small exports undoubtedly consist of sugar derived from imported raw sugar.

³ Source of imports:

Country	Quantity (1,000 gallons)	Foreign value (1,000 dollars)	Unit value (per gallon) (cents)
Cuba.....	7,739	1,256	16.2
All other countries.....	1,537	201	13.1
Total.....	9,276	1,459	15.7

⁴ Foreign value.

The liquid sugar covered by this report is distinguishable from other varieties of edible sugar sirups, which have distinctive flavors and are used in ways different from dry sugars. Liquid sugars, on account of their low content of nonsugar solids, are relatively colorless and flavorless. In recent years use of liquid in place of dry sugar in the manufacture of ice cream, bakery products, and confections has greatly increased. In 1939 liquid sugar accounted for about 2 percent

¹ Import data in this section include only entries of those sirups whose nonsugar content is 6 percent or less of total soluble solids.

of the total United States consumption of domestic cane and beet sugar. Most of the demand for liquid sugar has been supplied by domestic refineries, and under the quota system the amounts of sugar marketed in this form by domestic refineries, whether derived from domestic or imported raw sugar, are included in the total requirements fixed by the Secretary of Agriculture. (See section on Cane and Beet Sugar, paragraph 501.) Thus the domestic production of liquid sugar is included in the figures for total consumption of sugar in the section on cane and beet sugar, and the domestic production of liquid sugar is not properly to be considered an addition to sugar covered by the other section. The imports of liquid sugar, however, under the Sugar Act, are subject to a separate and absolute quota of 8.8 million gallons—8 million from Cuba, and 0.8 million from the Dominican Republic. The imports of liquid sugar provided for by quota were equivalent to about 35,000 tons of refined sugar. These imports, therefore, represent relatively small (little more than one-half of 1 percent) contribution to total United States consumption.

The quota provisions of the Sugar Act, including those limiting the imports of liquid sugar to 8.8 million gallons, were suspended on September 11, 1939. The quota control was restored at the beginning of 1940 but was again suspended in April 1942.

The duties on imports of liquid sugar from Cuba on July 1, 1939, were appreciably lower per unit of contained sugar than the duties on Cuban dry sugar. This was the case even though the duties on Cuban dry sugar had been reduced in 1934 under the flexible tariff provision, and again by the first trade agreement with Cuba, whereas the duties on liquid sugar remained those provided for by the Tariff Act of 1930. The general rates of duty in 1939 were very substantially lower than the general rates on dry sugar and this condition would prevail under all levels of duty to be considered in Senate Resolution 341. If the quota controls are restored the quota on liquid sugar will probably always be filled; if the quotas are not restored there might be a very considerable increase in the imports of liquid sugar.

POST-WAR SHORT TERM

The quota controls of domestic production and imports of sugar may not be restored in the year or two following the close of the war. If quotas should not be in effect, the imports of liquid sugar will probably be much larger than in pre-war years but may not be as large as they might be if return of the quota system were not to be anticipated in the long term.

POST-WAR LONG TERM

On account of the foregoing considerations, no estimates for domestic production of liquid sugar in the post-war period are given below. Whatever sugar may be marketed in liquid form by domestic refineries is covered by the estimates in the section on dry cane and beet sugar.

It is assumed in the section on sugar, that the control of domestic production and imports of sugar quotas will be restored in the post-war long term. It is also assumed that the quotas on liquid sugar will be in effect in that period. On these assumptions the quantity of imports of liquid sugar under both levels of income and all three levels of duty to be considered would be 8.8 million gallons. The

main effect of the different levels of duty would be on the foreign values.

Per capita income at 1939 level.

If prices of dry sugar should be higher than in 1939 by 5 percent, as is possibly the most reasonable expectation, the prices of liquid sugar will also probably be higher in the same proportion.

Duties as in 1939.—Imports would probably have a foreign value of about 1.45 million dollars.

Duties reduced by 50 percent.—Imports would probably have a foreign value of about 1.75 million dollars.

Duties increased by 50 percent.—Imports would probably have a foreign value of about 1.15 million dollars.

Per capita income 76 percent higher than in 1939.

If prices of dry sugar should be about 20 percent higher than at the lower-income level, as is estimated in the main report on sugar, the United States prices of liquid sugar will probably also be higher in about the same proportion, and the following estimates are made on that basis.

Duties as in 1939.—Imports would probably have a foreign value of about 1.75 million dollars.

Duties reduced by 50 percent.—Imports would probably have a foreign value of about 2.05 million dollars.

Duties increased by 50 percent.—Imports would probably have a foreign value of about 1.45 million dollars.

EDIBLE MOLASSES AND SUGAR SIRUPS (EXCLUDING LIQUID SUGAR)

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)	
			(Under quota)	(In excess of quota)
502.....	Edible molasses and sugar sirups, of which nonsugar solids account for more than 6% of total soluble solids:			
	General rate.....	$\frac{1}{2}$ ¢ per gal. + $\frac{1}{100}$ ¢ per gal. for each percent of total sugars over 48%.	17%	26%
	Cuban molasses.....	$\frac{3}{16}$ ¢ per gal. + $\frac{1}{100}$ ¢ per gal. for each percent of total sugars over 48%.	46%	96%

NOTE.—These rates applicable to entries up to 1.5 million gallons annually. Imports in excess of such quantity dutiable at rates 50 percent higher. The Tariff Act of 1930 established a rate on edible molasses and sugar sirups of 0.25 cent per gallon plus 0.275 cent per gallon for each percent of sugar content over 48. The rates on the Cuban product were 20 percent less than those specified in the Act by virtue of the general preferential arrangement with that country. The duties on molasses and sugar sirups of which less than 94 percent of the total soluble solids consisted of sugar—the classification here under consideration—were reduced in the trade agreement with the United Kingdom, effective January 1, 1939, by one-third, thus establishing the rates shown above. The imports from all sources, however, at these reduced rates were limited to an annual quota of 1.5 million gallons.

In the trade agreement with Cuba, effective January 5, 1942, the duties on all edible types of Cuban molasses and sugar sirups, including those here under consideration, were reduced to 0.10 cent per gallon plus 0.11 cent for each percent of sugar content over 48. The reduction in the Cuban rates, however, did not affect those applicable to imports of molasses and sugar sirups from other countries. The Cuban agreement provided that the imports from Cuba were not to be chargeable against the quota provided for in the trade agreement with the United Kingdom. As a result, imports from Cuba of the molasses and sugar sirups under consideration are now enterable in unlimited quantities at the reduced rates provided for by the agreement with Cuba; imports from other countries to the amount of 1.5 million gallons annually are dutiable at the rates provided for in the agreement with the United Kingdom; imports from countries other than Cuba in excess of 1.5 million gallons are dutiable at the rates originally provided for in the Tariff Act of 1930.

The imports here under consideration are not, as are the imports of liquid sugar, subject to quota restrictions under the provisions of the Sugar Act of 1937.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 gallons).....	41,908	2,378	39,530	2,288	41,819	Percent
Value (\$1,000).....	17,347	904	16,383	1,324		
Unit value (cents per gallon).....	41.4	40.5	41.4	14.2		
Persons employed.....	(¹)					

¹ Represents exports of "sirup" only, including blended products.

² Foreign value.

³ Not available.

Data on United States imports under and in excess of the tariff quota in 1939 are given below:

Source and tariff treatment	Quantity	Foreign value	Unit value (per gallon)
Cuba:	<i>1,000 gallons</i>	<i>1,000 dollars</i>	<i>Cents</i>
Under quota.....	969	66.4	6.8
Over quota.....	332	22.3	6.7
Total.....	1,301	88.7	6.8
Other:¹			
Under quota.....	399	96.4	24.1
Over quota.....	588	138.6	23.6
Total.....	987	235.0	23.8
Combined total.....	2,288	323.7	14.2

¹ Principally British West Indies.

The molasses and sugar sirups covered by this report are principally products derived from sugarcane; sorgo sirups are also important in domestic production. In 1939 sorgo sirup produced in the United States amounted to about 10 million gallons. Of the remaining approximately 32 million gallons of domestic production, 22 million were of cane sirup (sirup derived from cane juice without extraction of sugar); about 6 million gallons were of molasses produced in conjunction with raw sugar in cane-sugar mills; and about 4 million were of refiners' sirup, a byproduct of cane-sugar refining.¹

If all economically recoverable sugar is extracted from the cane by a raw-sugar mill, the residue is inedible molasses, but with some sacrifice in the recovery of sugar much of the residue can be ordinarily sold as edible molasses. In refining cane sugar some of the molasses residue is converted into refiners' sirup by filtering and other processing; unless so treated the residue is inedible molasses. In the few years before the war the United States output of edible molasses and refiners' sirup was equal to about one-fifth of the inedible molasses and sugar sirups produced.

¹ Not covered by this section or the foregoing statistics, are corn sirup and maple sirup, which are dutiable under paragraph 803. In 1939 domestic production of corn sirup was about 99 million gallons and imports of corn sirup were insignificant. Information on maple sirup is given in a separate section.

Sorgo and cane sirups produced on farms or in small (custom) sirup mills are for the most part consumed on the farms or marketed locally. Molasses and cane sirups produced by raw-sugar mills and refiners' sirups, which find wider distribution through large food-processing and marketing concerns, are frequently marketed as table sirups or blended with corn sirup, clear sugar sirups, or maple sirup. Molasses is also used extensively by the baking industry. The prices of sorgo sirups and cane sirups produced for local sale are frequently twice or more those of molasses and refiners' sirups.

Before 1939 virtually all of the imports here considered were from the British West Indies and were of the type known as Barbados molasses. This product is produced from whole cane juice in an open-kettle process. Barbados molasses has a certain flavor which none of the domestic products has and, therefore, has had a special market, particularly for blending purposes. The imports of Barbados molasses had an average foreign value of about 25 cents a gallon. Although before 1939 there were virtually no imports from Cuba of the type covered by this section, in that year Cuba was the principal source. These Cuban sirups were made by raw-sugar mills from surplus sugarcane, and sirups so produced do not have the flavor characteristic of Barbados molasses. The imports from Cuba had an average foreign value of less than 7 cents a gallon.

Before the war there was a downward trend in the consumption of the molasses and sugar sirups here under consideration. This decline was accompanied by increased consumption of corn sirups, which, as already indicated, are sometimes blended with molasses and refiners' sirup. Presumably, the farm and "custom" mill production of sorgo and cane sirup will continue to serve demands largely independent of those for other sirups. Molasses, both that produced by domestic raw-sugar mills and that imported from the British West Indies, will probably also continue to supply special demands. The consumption in the future of cane sirups (sirups made from cane juice without extraction of sugar) produced by sugar mills is more uncertain and will probably depend partly on the relative prices of such sirups and corn sirup. The prices of cane sirup are closely related to conditions in the sugar trade; when sugar mills can profitably market all the sugar recoverable from available cane, they tend to produce less cane sirup than when a surplus of sugarcane exists.

In 1943 and 1944 consumption of edible molasses and sugar sirups was about 25 percent greater than in 1939. This increase was probably owing to the difficulties of wartime marketing of sugar, and the resulting increased prices of sirups and increased production of molasses and refiners' sirup. These types of sirup accounted for most of the increase in production. Production of cane sirup and sorgo sirup was approximately the same in 1943 and 1944 as in 1939.

When the tariff quota was provided for in the trade agreement with the United Kingdom it evidently was contemplated that the bulk of the imports in this classification would come from the British West Indies, as they had in the past, and no provision was made for allocation of the quota among sources of supply. Imports from Cuba in 1939, however, accounted for almost 70 percent of the imports within the quota, and, though the imports from the British West Indies were less than two-thirds as much as the quota, about 60 percent of the sirups from the British West Indies were entered after the quota was filled

and were, therefore, dutiable at the pre-agreement rates. Imports from Cuba also accounted for large portions of the quota in 1940 and 1941. This situation was altered by the agreement with Cuba which became effective January 5, 1942. The latter agreement made a further reduction in the duty on imports from Cuba and in addition provided that the imports from Cuba would not be chargeable against the tariff quota on imports under trade agreement with the United Kingdom. In the analysis to follow of the probabilities regarding production and imports of molasses and sugar sirups it is assumed (1) that the tariff quota arrangement will apply only to imports from countries other than Cuba and (2) that imports from Cuba in unlimited quantities will be dutiable at 20 percent less than the rates applicable to imports within the quota from other countries. If these assumptions should prove incorrect, the estimates to follow would have to be revised substantially.

POST-WAR SHORT TERM

When sugar ceases to be rationed, per capita consumption of edible molasses and other cane-sugar sirups is likely to return to about the pre-war level, or, if the downward trend in the consumption of sirups derived from sugarcane should be resumed, to something less than the pre-war levels. In the post-war short term, imports will probably be considerably smaller than in 1939 in volume, because the demand for Cuban sugar may be relatively strong and there may, therefore, be less inclination for the Cuban producers to market cane sirups in the United States. In this period, therefore, the imports of Barbados molasses will probably be in greater proportion than in 1939. Domestic production may probably be somewhat larger than in 1939, the increase being probably accounted for largely by molasses from raw-sugar mills and by refiners' sirup.

POST-WAR LONG TERM

Consumption, Production, and Imports

There is great uncertainty as to the volume of consumption of molasses and sugar sirups in the future. An increased proportion of total sirup consumed will be accounted for by corn sirup, and the downward trend in United States consumption of sirups derived from sorgo and sugarcane which appeared before the war will be resumed. In addition there is also uncertainty as to the proportions in which United States consumption of sirups derived from sugarcane may be supplied by imports and domestic production. If there is surplus production of sugarcane in foreign countries, and especially Cuba, there may be diversion of part of the surplus to the production of cane sirups, and imports into this country of the type which were imported from Cuba in 1939 may be large. If there be no such surplus production of sugarcane in Cuba, imports into the United States of the sirups here under consideration may be confined largely to Barbados molasses. This factor is likely to be much more important in influencing the quantity of imports than are the levels of duty.

The uncertainty regarding the sugar market in Cuba and the important effect of conditions there on the volume of imports of cane sirup from Cuba are responsible for the wide range of the estimates given

below. The wider range in the estimates of quantities as compared with those of values of imports is due to the expectation that, if imports reach the larger quantities within the range, they will consist in large part of the lower priced Cuban product; if imports are in smaller quantities, the comparatively stable importation of the much higher priced Barbados molasses will constitute a large part of the total.

Per capita income at 1939 level.

Per capita consumption of molasses and sugar sirups in the post-war long term with this level of income is likely to be smaller rather than larger than it was in 1939. Total consumption might range from 40-44 million gallons, depending in part on the rate of duty. Importation of Barbados molasses would probably be affected to only a limited degree by the rate of duty. Such imports would probably not exceed the quota of 1.5 million gallons at any of the levels of duty to be considered. Average unit values for the group as a whole are assumed to be about the same as in 1939.

Duties as in 1939.—Imports might be about 2-4 million gallons, depending on whether considerable imports from Cuba are available. The foreign value of imports may range from \$350,000 to \$500,000. Domestic production would probably be about 37-40 million gallons, with a value possibly of 15-17 million dollars.

Duties reduced by 50 percent.—Imports, especially of the low-priced sirups from Cuba, would probably increase considerably and might be 4-6 million gallons, with a foreign value of 0.6-0.8 million dollars. Domestic production might be 36-39 million gallons, valued at 14-16 million dollars.

Duties increased by 50 percent.—Such an increase would restore the duties within the quotas to those in effect before 1939. Imports would probably be confined largely to Barbados molasses and would probably be about 1.5 million gallons, with a foreign value of possibly \$250,000 to \$300,000. Production might be expected to be 40-44 million gallons, with a value of 16-18 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption might be 10 to 20 percent greater than in 1939 owing to a substantial increase in commercial baking and possibly to some increase in direct consumption of molasses and sugar sirups. Consumption is, therefore, estimated at, say, 45-50 million gallons. Average unit values for the group as a whole are assumed to be about 20 percent over those in 1939.

Duties as in 1939.—Imports might be about 3-5 million gallons with a foreign value of, say, 0.8-0.9 million dollars. Domestic production would probably be 40-45 million gallons, with a value of from 19-24 million dollars.

Duties reduced by 50 percent.—Imports might be about 5-7 million gallons with a foreign value of 1-1.3 million dollars. The prices of domestic sirups might be somewhat lower under reduced duties. Production might be about 39-45 million gallons, and have a value of 18-22 million dollars.

Duties increased by 50 percent.—Imports would probably consist principally of Barbados-type molasses and might be about 2-2.3 million gallons, with a foreign value of \$500,000 to \$550,000. Domestic production would probably be 44-46 million gallons with a value of 22-25 million dollars.

Exports

Usually, a small part of the domestic production of edible molasses and sugar sirups is exported.¹ In official statistics exports under the classification "sirup," probably consist principally of blended sirups, including products composed of mixtures with invert sugar sirup or corn sirup. The large exports of these sirups in 1939, amounting to 2.4 million gallons valued at 1.0 million dollars (40.5 cents per gallon) were 6½ times as large as the average for the 4 preceding years; in those years the average unit value of the exports ranged between 27 and 46 cents per gallon. In the immediate post-war period United States exports of edible molasses, sirups, and related products will probably be in great demand, especially in European markets, but in the post-war long term, domestic exports will probably not be greatly in excess of the pre-1939 level, or about 365,000 gallons.

Employment

Cane molasses and refiners' sirup are byproducts in the manufacture of sugar and any extra labor involved in their production and packing is included in the employment data for the cane- and beet-sugar industry. Cane sirup and sorgo sirup, however, are produced chiefly on farms. Data published by the Department of Agriculture indicate that, including production and harvesting cane and making and packing the sirup, an 8-hour day is required to produce 6½ gallons of cane sirup or 5½ gallons of sorgo. On this basis in 1939, the equivalent of possibly 15,000 full-time persons on a year-round basis were required to produce the reported output of cane and sorgo sirup, exclusive of cane sirup produced by sugar mills in Louisiana for which separate employment data for making sirup are not available.²

The production of cane and sorgo sirups on farms and by custom sirup mills may not greatly exceed that in 1939 even though the total production of sirups under consideration may, under certain circumstances previously discussed, exceed that total. The estimated figures for employment in 1939 on these farm sirups will probably not be much exceeded in the future. Variations in the production of edible molasses and refiners' sirups would affect the number employed in the sugar industry only slightly.

INEDIBLE MOLASSES

Tariff paragraph: 502.

Commodity: Molasses, not for further extraction of sugar or for human consumption.

Rate of duty: 0.03 cent per pound of sugar content. *Equivalent ad valorem (1939):* 5%.

NOTE.—The rate of 0.03 cent per pound of total sugar content of blackstrap molasses is equivalent to approximately ¼ cent per gallon. In the trade agreement with Cuba, effective January 5, 1942, the rate on Cuban molasses was reduced 50 percent from 0.024 to 0.012 cent per pound of sugar content. The general rate of 0.03 cent per pound of sugar content, provided for in the Tariff Act of 1930, has not been changed.

¹ Corn sirup, however, is an important export product of the United States, the exports during 1939 amounting to 49.5 million pounds (equivalent to approximately 4.3 million gallons) valued at 1.4 million dollars.

² This employment is listed as part of the employment in the sugar industry. (See separate report on Cane and Beet Sugar).

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export ¹	For domestic market			
Quantity (1,000 gallons).....	146,960	19,885	127,075	² 203,487	³ 330,562	<i>Percent</i> 62
Value (\$1,000).....	4,954	544	4,410	⁴ 6,420		
Unit value (cents per gallon).....	3.37	2.74	3.47	3.15		

¹ Official export statistics do not differentiate between inedible and edible molasses; therefore, these figures include small quantities of molasses exported for edible purposes and to this extent the apparent consumption is underestimated.

² Actual imports from Cuba of 160.4 million gallons are estimated to include about 20 percent high-test molasses. One gallon of high-test molasses is equivalent, as regards sugar content, to approximately 1.4 gallons of blackstrap molasses. The approximate figure for imports of high-test molasses was converted to blackstrap equivalent to obtain the figures here shown for imports and apparent consumption.

³ Foreign value.

The term "molasses," as used in the following discussion, is to be understood exclusively as inedible molasses; that is, molasses not fit or not used for human consumption, as distinguished from edible molasses and sugar sirups which are dealt with in a separate report of this series. Inedible molasses as discussed here consists of two major types, namely, blackstrap molasses (that is, final molasses obtained as a byproduct in the manufacture of raw sugar and also in sugar refining, with a sugar content of from 50 to 55 percent) and high-test molasses, made from surplus cane, without the extraction of sugar, chiefly in Cuba, and with a sugar content usually of at least 75 percent, or an average of about 40 percent greater than that of blackstrap molasses.

All of the domestic production under consideration consists of blackstrap molasses. Until the early thirties virtually all of the imports also were of blackstrap molasses but after 1935 a considerable proportion of the imports was high-test molasses from Cuba. Possibly 30 million gallons of the imports in 1939, and larger amounts in the 2 or 3 preceding years, consisted of high-test molasses. Since for the most important uses of inedible molasses the sugar content is the important consideration, the gallonage of imports shown in official import statistics has been adjusted to arrive at the figures for imports and apparent consumption shown in the foregoing table.

The principal uses of inedible molasses in the United States are in the production of industrial alcohol and in mixed feeds for livestock. Virtually all of the high-test molasses is used in the production of industrial alcohol, and on the basis of sugar content, alcohol production in 1939 accounted for about 190 million gallons. From 50-75 million gallons of molasses were used annually in recent pre-war years in mixed livestock feeds. The remainder was used in the production of yeast, vinegar, citric acid, rum, and butyl alcohol. Separate figures for the amounts used for the latter are not available.

The computed figure for apparent consumption in the United States of 330 million gallons of molasses for all purposes in 1939 was probably

10 to 15 percent less than the average annual consumption for the years 1935 to 1939.

Annual domestic production of blackstrap molasses varies with the volume of sugar produced and in this respect the year 1939 was reasonably normal. Approximately one-half of the domestic output of molasses was cane-sugar molasses produced in Puerto Rico and Hawaii, and the other half consisted of both beet-sugar molasses and cane-sugar molasses (from raw-sugar mills and refineries) produced in continental United States. Of the molasses produced in Puerto Rico and Hawaii during 1937-39 nearly two-thirds was shipped to continental United States and the remainder was used on the Islands for making rum and for other purposes.

Cuba has been the principal source of United States imports of blackstrap molasses, contributing about 90 percent of total imports during the immediate pre-war years. The Dominican Republic and Netherlands East Indies were other important sources. The total imports in 1939 were about 15 percent less in quantity than the average annual imports for the years 1935 to 1939 and 40 percent less in total value.

The average wholesale price¹ of blackstrap molasses at North Atlantic ports in tank-car lots was 5.3 cents per gallon in 1939, or 24 percent less than the average of 7.0 cents for the years 1935 to 1939. This decline was probably due partly to the increased supply of high-test molasses from Cuba and partly to the decline in price of industrial alcohol, the principal outlet for molasses.

In 1939 about 70 percent of the United States production of alcohol was made from molasses, 22 percent from petroleum, and 8 percent from grains. The production from petroleum is a fairly recent development and it is possible that there may be in the future a further expansion in the production of alcohol derived from petroleum. As raw material for the production of alcohol, molasses provides a much cheaper source than grains.

During the war the enormous increase in the demand for alcohol for direct military use and for the production of butadiene, used in making synthetic rubber, resulted in a great increase in the production of alcohol. In 1944, probably as much as one-fourth of the total output of alcohol was made from molasses; the remainder was made from grains and petroleum.

In post-war years molasses will probably resume its position as the principal raw material for the production of industrial alcohol. However, a large expansion in the production of alcohol from petroleum with or without a great increase in the demand for alcohol might greatly change this outlook. If there should be a substantial production of synthetic rubber, with alcohol used for the production of butadiene, a very large production of alcohol would be required. In that event byproduct molasses would almost certainly not provide material for nearly as large a percentage of total alcohol production as in pre-war years. Unless the production of alcohol from petroleum were greatly expanded there would probably be a great increase in the production of high-test molasses and possibly also a great increase in the production of alcohol from grain. Under these circumstances the price of alcohol and of blackstrap molasses would probably be substantially higher than in pre-war years. In the face of these

¹ Oil, Paint, and Drug Reporter quotations.

uncertainties it seems reasonable to base the estimates of future production and imports of inedible molasses on the customary uses of molasses and the products derived therefrom in the pre-war period and on such new uses as are fairly closely related to the old ones. In the following analysis, it is assumed that the synthetic-rubber program or expansion of production of alcohol from petroleum will not be a dominant factor in the post-war production and imports of molasses. Our estimates, however, could be very far off the mark if these assumptions turn out to be wrong.

POST-WAR SHORT TERM

The demand for molasses in the normal pre-war outlets may considerably exceed the relatively low level of 1939. Because of this and the restrictions, during the war, in the use of alcohol for nonmilitary purposes and of molasses for feed, and because of the assumed increased industrial activity over that in pre-war years, the demand during the immediate post-war years for blackstrap molasses in its normal pre-war uses might easily exceed that in 1939 by 30 percent. Domestic production would probably increase with the assumed increase in the production of sugar but the larger share of the increased demand would be expected to be supplied by imports stimulated by the higher prices which would be likely to follow the larger demand, the duty being a minor part of the landed cost of molasses.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The consumption of blackstrap molasses for livestock feeds and for the production of citric acid, yeast, vinegar, acetone, and butyl alcohol will probably be appreciably above that in 1939 as a result of increase in population and in continuance of a slightly upward trend in the pre-war use of molasses for these purposes. There will probably be also an increase in the consumption of ethyl alcohol, in its ordinary industrial uses, to say nothing of its possible application in synthetic rubber. New uses for alcohol in the chemical industry are also likely to be found. On the supposition that molasses will maintain its position and excluding its possible use for making alcohol in manufacturing rubber, United States consumption may be in the neighborhood of 400 million gallons, which would be approximately 20 percent more than the relatively low apparent consumption in 1939. Of this, domestic production, on the basis of estimated sugar production, might supply, say, about 160 million gallons. It seems probable that the price of molasses would be 10 percent higher than the low unit values prevailing in 1939, and the total value of production would thus be about 6 million dollars. Imports might be about 240 million gallons with a foreign value of possibly 8 million dollars.

It is assumed that a 50-percent increase or decrease in the rate of duty in effect in 1939 (equivalent to only 5 percent ad valorem on the basis of relatively low unit values prevailing then) would have an unimportant effect on volume of United States consumption and imports of blackstrap molasses and thus have only a minor effect on United States prices of this commodity. The duty at present on Cuban molasses is only half that of 1939.

Per capita income 75 percent higher than in 1939.

At this high level of purchasing power, it may be expected that the consumption of molasses for stock feed, for pre-war industrial outlets, and for a number of similar but new uses might increase to as much as 45 percent over the relatively low level of 1939 and amount to possibly 475 million gallons. Of this, assuming the present or similar sugar-quota system to be in effect, domestic production of blackstrap molasses would approximate 185 million gallons with a value of possibly about 8.2 million dollars, assuming a domestic price of molasses about 35 percent above 1939. The higher prices for molasses might result in imports approaching 300 million gallons with a foreign value of possibly 12 million dollars.

At the higher domestic prices, an increase or decrease by 50 percent in the rate of duty would have only minor effects on the volume of United States consumption and imports of blackstrap molasses.

Molasses requirements for any significant alcohol synthetic-rubber program would be in addition to the quantities estimated above.

Exports

No data are available on exports of blackstrap molasses because in official export statistics they are combined with edible molasses. It is estimated, however, that exports will not exceed 10 million gallons annually.

Employment

Blackstrap is a byproduct of sugar manufacturing. For discussion of employment see section on sugar, paragraph 501.

MAPLE SUGAR AND SIRUP

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
503	Maple sugar	3¢	19%
	Maple sirup	2¢	

NOTE.—The 1930 Tariff Act rate on maple sugar was 8 cents per pound and on maple sirup, 5½ cents. These rates were reduced to 6 and 4 cents, respectively, effective March 7, 1931, pursuant to Presidential Proclamation under section 336 of the Tariff Act. The duty on maple sugar was reduced to 4 cents pursuant to the first Canadian agreement, effective January 1, 1936, and then to 3 cents pursuant to the second Canadian agreement, effective January 1, 1939. The duty on maple sirup was further reduced to 2 cents per pound pursuant to the second Canadian agreement.

GENERAL

Data on United States production, imports, and consumption for 1939 and 1940 are given below:

Item	Production ¹ for domestic market	Imports	Apparent consumption	Ratio of imports to consumption
				<i>Percent</i>
<i>1939</i>				
Quantity (1,000 pounds) ²	20,496	11,546	32,032	36
Value (\$1,000)	4,330	1,787		
Unit value (cents per pound)	21.1	15.0		
Farms producing (number)	20,584			
<i>1940</i>				
Quantity (1,000 pounds) ²	21,210	7,476	28,686	26
Value (\$1,000)	4,413	1,023		
Unit value (cents per pound)	20.8	12.7		

¹ Exports were negligible.

² Sugar and sirup combined in terms of sugar (11 lb. of sirup equal to 8 lb. of sugar).

³ Foreign value.

The United States and Canada consume and produce virtually the entire world supply of maple sugar and sirup. About three-fourths of the United States consumption is used for food as straight or blended sirups, as flavoring, and as maple sugar. This part of the demand tends to vary somewhat with changes in national income and inversely with price changes. Approximately one-fourth of the consumption is used by tobacco manufacturers chiefly for flavoring. From year to year this part of the demand is influenced somewhat less by price changes. The general trend of consumption has been downward particularly since about 1930, partly owing to the discontinuance of the use of maple sugar by some tobacco manufacturers.

In both the United States and Canada these products are made from the sap gathered from maple trees which grow wild in forests and groves. Production in each country ranges from 20 to 30 million pounds annually in terms of sugar, assuming 8 pounds of sugar to one gallon, or 11 pounds, of sirup. The average annual domestic production declined from about 30 million pounds in 1919-23 to 21 million pounds in 1936-40. The number of trees tapped and the weather determine the volume of production in any one year; the number of trees tapped declined from approximately 17 million to 11 million between the 5-year periods mentioned above, owing in part to the cutting of maple trees for lumber. Canadian production has been maintained at about 26 million pounds annually.

Usually, from 15 to 25 percent of the Canadian production has been taken by the United States. In 1939, United States imports were exceptionally large and amounted to 11.5 million pounds, which represented about 40 percent of the Canadian production. This increase in imports was due to damage to maple trees in New England by the hurricane of September 1938 and its anticipated adverse effect on the domestic crop, to the unusually large 1938 Canadian crop, and to the tariff reduction from 4 to 3 cents on sugar and from 3 to 2 cents on sirup, effective January 1, 1939.

POST-WAR SHORT TERM

It is assumed that during the first few years after the war, the consumption of maple products will be somewhat less than that of 1939. Domestic production will probably not be very much higher than before the war, although there may be some increase owing to some less accessible trees being tapped, in view of the higher prices which may be expected to prevail. Imports would probably be somewhat lower than the unusually high imports of 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

In view of its long-time downward trend before the war the probabilities are that United States production of maple sirup and sugar in the 1950's will be somewhat lower than the average during the immediate pre-war years, and will amount to, say, around 20 million pounds, valued at about 4.2 million dollars at 1939 prices. This volume will probably be the same whether national income is as in 1939 or 75 percent higher and whether duties remain the same or are increased or decreased by 50 percent. At the higher level of income the value of

domestic production might be expected to approximate 4.8 million dollars. With domestic production more or less stabilized at about 20 million pounds, increased demand in the post-war long term would tend to be satisfied largely by imports. If this should prove to be true and if imports should conform to the probabilities indicated below, then consumption in the post-war long term might be as low as 25 million pounds (with national income at either the 1939 level or 75 percent higher and with a 50-percent increase in duties) or as high as 31 million (with income at the 1939 level or 75 percent higher and with a 50-percent decrease in duties).

Per capita income at 1939 level.

Duty as in 1939.—Imports in 1939 were unusually large and, therefore, post-war long-term imports may not amount to more than 60 to 70 percent of the 1939 imports—that is, 7–8 million pounds at a foreign value of about 1 million dollars.

Duty reduced by 50 percent.—This would tend to increase somewhat the price Canadian producers could obtain on the United States market. Consequently the United States importers might obtain a larger proportion of Canadian production, and imports may amount to 7–11 million pounds with a foreign value of 1.0–1.4 million dollars.

Duty increased by 50 percent.—Imports might decline to, say, 5–6 million pounds, with a foreign value of 0.7–0.9 million dollars.

Per capita income 75 percent higher than in 1939.

The higher national income and increased population would tend to raise demand for maple sugar appreciably. However, neither the production in the United States nor that in Canada can be expanded significantly, and the demand in the Canadian market, under the assumption of a corresponding increase in the national income of Canada, would compete with the demand by United States importers. Thus, no material increase seems probable in the quantities consumed, produced, or imported over those which have been given as probable in the case of per capita income as in 1939.

The price of maple sugar both in the United States and Canada, however, may be expected to be from 10 to 15 percent higher than in 1939, and hence the foreign value of imports would be correspondingly higher. With duty as in 1939, imports might have a foreign value of 1.0–1.2 million dollars; with a decrease of duty by 50 percent, imports might have a foreign value of, say, 1.2–1.6 million dollars; and with an increase of duty by 50 percent, imports might have a foreign value of, say, 0.8–1.1 million dollars.

Employment

Employment involved in the production of maple products is confined chiefly to the gathering of the maple sap and boiling it down to the consistency of sirup or until it crystallizes into sugar. The "run" usually lasts about four weeks and during this period the whole operation is completed and is thus highly seasonal. The work is usually performed by the 30,000 farmers who are the producers and their families, with the addition of some local labor, depending on the number of trees to be tapped on the particular farm. Variations in national income and rates of duty should affect employment to only a minor extent and this would be local and seasonal.

SUGAR CANDY AND CONFECTIONERY

Tariff paragraph: 506.

Commodity: Sugar candy and confectionery.

Rate of duty: 20% or 40%.

Equivalent ad valorem (1939): 21% (average).

NOTE.—The rate of 40 percent ad valorem was fixed in the Tariff Act of 1930 on sugar candy and confectionery regardless of value. Pursuant to the trade agreement with the United Kingdom, effective January 1, 1939, the rate on these commodities, when valued at 6 cents or more per pound, was reduced to 20 percent. In addition to the duty, an import tax of approximately ½ cent per pound of total sugars was imposed by the Sugar Act of 1937 on articles in chief value of manufactured sugar (Internal Revenue Code, sec. 3500).

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 lb.).....	2,081,833	7,787	2,074,046	3,239	2,077,285	Percent
Value (\$1,000).....	308,250	1,146	307,104	1,563		0.2
Unit value (cents per pound).....	14.8	14.7	14.8	17.4		
Persons employed (number).....	61,111					

¹ Foreign value.

² The chocolate and cocoa products industry employed 6,464 persons in 1939. An undeterminable proportion of these were engaged in making confectionery items, such as chocolate bars, and are in addition to those reported above.

Imports of sugar candy and confectionery valued at less than 6 cents per pound in 1939 constituted only about 5 percent of the total volume of imports of this commodity.

The group sugar candy and confectionery includes not only articles generally accepted as candy and confectionery but also the competitive chocolate products such as chocolate bars made by the cocoa and chocolate-products industry. The term "confectionery" as used hereafter will include sugar candy, confectionery, and competitive chocolate products.

Per capita consumption of candy and confectionery appears to have been comparatively stable with a slightly upward trend during the pre-war period. During the 3 years 1937-39, the average total annual consumption was 2,021 million pounds; in 1939 it was 2,082 million pounds with a total value of 309 million dollars. A survey by the Department of Commerce indicates that the average wholesale price of confectionery in 1943 increased about 50 percent and the consumption per capita about 20 percent over that of 1939.

For many years before the war imports have amounted to not more than one-fourth of 1 percent of consumption and in recent pre-war years have amounted to less than half as much. Usually the larger part of imports consisted of high-quality candies packed in fancy containers. Imports during the war have increased to a record quantity, in excess of 35 million pounds, or about 1½ percent of consumption. The bulk of this increase, consisting chiefly of hard candies, came from Cuba and Mexico, where the industry was recently developed on a commercial basis, and a part of this trade may be expected to be continued after the war.

POST-WAR SHORT TERM

It is assumed that ample raw materials, such as cocoa products and milk will be available to the domestic candy manufacturer, and that the consumption of confectionery will tend to increase somewhat in line with the increase in purchasing power. With prices and income at the 1943 level and raw materials more freely available, consumption may increase from 20 to 25 percent over that in 1939. The great bulk of this would be supplied by domestic production, even if imports should continue at the high level attained during the war. However, when ample quantities of sugar are again available to domestic manufacturers, imports may decline to between their war and their 1939 levels and, if so, imports would probably not exceed the equivalent of 1 percent of domestic consumption.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

It may be assumed that the per capita consumption of confectionery under these conditions will be substantially that of 1939 and taking into account increased population would result in a 10-percent increase in total consumption, bringing it to about 2¼ billion pounds. Owing to the tendency of domestic manufacturers to increase the type of candies permitting mass production, unit prices may be slightly lower than in 1939, say, from 14 to 14½ cents per pound, resulting in an approximate total value of consumption of 300-350 million dollars. Since both imports and exports represent such a small part of domestic consumption, neither domestic consumption nor production, when expressed in hundreds of millions or in billions of pounds, would be much affected by the changes in the volume of imports which may result from the assumed changes in the rate of duty.

Duty as in 1939.—In view of the greatly increased imports from Cuba and Mexico during the war it seems probable that imports will continue at a level appreciably above that of 1939, although below the war level, and amount to as much as, say, 10-15 million pounds with a foreign unit value of from 12 to 15 cents per pound, and a total foreign value of 1-2 million dollars. This would be considerably less than 1 percent of domestic consumption.

Duty reduced by 50 percent.—This might result in somewhat larger imports but such imports would probably consist chiefly of lower-priced items. There might be an increase in the volume of imports to, say, 20-30 million pounds or 1 to 1½ percent of consumption, and at somewhat lower unit values would indicate a total foreign value of 3-4 million dollars.

Duty increased by 50 percent.—Such an increase would, no doubt, have a retarding influence on imports but certain specialties and hard candies would probably continue to come in. It is estimated that imports might amount to, say, 6-8 million pounds, valued at from 0.5-1 million dollars.

Per capita income 75 percent higher than in 1939.

It is possible that with the higher per capita income and with prices from 10 to 15 percent higher, consumption per capita might increase as much as 30 percent over that in 1939, bringing total consumption

to about 3 billion pounds, valued at 475-500 million dollars. Since imports constitute such a small part of domestic consumption neither consumption nor production, when expressed in millions or billions of pounds, would be much affected by the assumed changes in the rate of duty.

Duty as in 1939.—Imports might not be much larger in proportion to estimated consumption than assumed under 1939 level of income, but might include a slightly larger proportion of the better types, thus possibly increasing the foreign unit value of imports. Imports might amount to as much as 12-15 million pounds, with a foreign value of approximately 1.5-2.5 million dollars.

Duty reduced by 50 percent.—The reduction in duty would probably result in appreciably larger imports both in quantity and value, but particularly in value, owing to the imports having possibly a larger proportion of higher grade candies and reach, say, as much as 30-45 million pounds or 1 to 1½ percent of consumption and have a foreign value of from 3.5-6.0 million dollars.

Duty increased by 50 percent.—Such an increase would likely have a retarding influence on imports of certain types of candy but might be less effective on the hard candy trade developed during the war. Imports might equal 8-10 million pounds, with a foreign value of approximately 1¼-1½ million dollars.

Exports

Exports in 1939 were less than one-half of 1 percent of domestic production but more than twice that of imports; moreover, on the basis of export statistics during the 15 years preceding 1939, foreign demand for United States confectionery will probably be small in relation to domestic production with duties by foreign countries as before the war. More than 40 percent of the exports went to Latin-American countries. The other principal countries were United Kingdom, taking about 25 percent; Philippine Islands, with 18 percent; and Canada, with 5 percent of total exports in 1938 and 1939. A reduction of duties on confectionery, particularly in Latin America, where they are very high, might result in some increase in exports but how much cannot be predicted.

Employment

The trend in the domestic production of confectionery has been toward lines of goods which permit of mass production thus requiring less labor per unit of output. For instance, the total production reported for the candy and confectionery industry in 1939 was about 10 percent greater in volume than in 1929, but the number of employees engaged in the industry had declined more than 20 percent. Consequently, if the demand for confectionery should increase materially during the post-war period, the number of employees required to supply the larger demand would increase proportionately less.

SCHEDULE 6. TOBACCO AND MANUFACTURES, AND RELATED ITEMS PROVIDED FOR IN THE FREE LIST

INTRODUCTION AND SUMMARY

All items in schedule 6 except cigarettes (the imports of which in 1939 were much less than \$100,000) are covered in this section. The only article of tobacco which is not subject to duty is tobacco stems not cut, ground, or pulverized (free under par. 1787); imports of this article are quite small, and the domestic production is not known.

The number of dutiable articles which are presented under schedule 6 is five. The total value of the imports of these articles on which duty was actually paid in 1939 was \$36,050,000; imports of the same articles valued at \$4,370,000 entered from the Philippines duty-free. These five commodities thus accounted for \$40,420,000, out of a total value of \$40,450,000 for imports under this schedule, the only other item being cigarettes.

It must be noted that cigarettes, by far the most important form of manufactured tobacco in United States production, are not covered in this report. The total value of the production of cigarettes in 1939 is estimated to be 354 million dollars, excluding excise taxes. Imports in that year were only \$30,000 (foreign value), whereas exports amounted to 12.6 million dollars.

There is no close comparability between the domestic production and the imports. The imports consist either of special types and grades of relatively high price, or of the product of the Philippine Islands, hitherto duty-free and very low in price, compared with the domestic product.

Leaf tobacco requires aging (which involves much shrinkage in weight) before it is suitable for the manufacture of cigarettes, cigars, and other tobacco products. The crops of the different kinds of leaf vary materially from year to year, whereas the consumption of the aged leaf is much more constant. In the summary of estimates the pre-war statistics used for the value of production for the domestic market relate to the consumption of domestic leaf, in shrunk condition. The forecasts of future production are on the same basis.

A considerable proportion of the total imports of cigar filler tobacco and of cigars into the United States in the pre-war period came from the Philippines, free of duty. In the estimates regarding post-war imports and production, data are given on the assumption that the Philippine tobacco and cigars will be subject to the full rates of duty.¹ Even if those rates should be reduced by 50 percent, imports of leaf tobacco and cigars from the Philippines would become insignificant.

¹ This point is discussed in the general introduction.

In order to make a worth while comparison between the pre-war totals and the post-war estimates for imports, it is necessary to exclude the pre-war imports from the Philippines.

Estimated production for the domestic market (not including the large exports) and imports under the several assumptions regarding income and rates of duty are summarized below:

Period, income level, and tariff treatment	Production for domestic market		Imports (foreign value)	Ratio of dutiable imports to those of 1939
	Value ¹	Ratio to 1939		
	Million dollars ² 439.9	Percent 100	Million dollars 40.4	Percent
1939, total.....				
Dutiable.....			36.0	100
Duty-free from Philippine Islands.....			³ 4.4	
Post-war long term:				
Per capita national income same as in 1939:				
Duty as in 1939.....	511.6	116	37.9	105
Duty reduced 50 percent.....	510.9	116	51.2	142
Duty increased 50 percent.....	512.2	116	31.4	77
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939.....	792.4	180	65.8	153
Duty reduced 50 percent.....	791.4	180	88.2	245
Duty increased 50 percent.....	793.1	180	54.7	152

¹ Excludes excise taxes on manufactured products.

² Includes leaf tobacco actually consumed in 1939. The sum of the values of "production for the domestic market" included in the comments on the individual products is much higher, 529 million dollars. Much of the production of leaf in that year went into stocks.

³ For the post-war period imports from the Philippines are assumed to be dutiable, and are estimated as virtually nil.

It is estimated that, with per capita income at the 1939 level and with no change in the rates of duty, the combined value of the production of the several articles in the long-term post-war period will exceed that in 1939 by about one-sixth, or considerably more than the assumed increase of 10 percent in the population. The explanation lies partly in the fact that the per capita consumption of cigarettes (and consequently of cigarette leaf tobacco) is likely to be considerably higher than before the war, following the steadily increasing trend in earlier years. A second factor explaining the increase in value over 1939 is that the price of cigarette leaf tobacco in 1939 was abnormally low, and the estimate of the price of such tobacco in the post-war period is based on the considerably higher average unit price which prevailed for a number of earlier years preceding the war.

The estimated total imports of the articles covered by this table in the post-war period, assuming no change in per capita income or in the rates of duty, are somewhat less than the actual total imports in 1939 which included considerable quantities from the Philippines, but somewhat greater than the imports from countries other than the Philippines. A reduction of 50 percent in the rates of duty, with national income at the 1939 level, would, according to the estimates, result in imports about one-third greater, in value, than with no change in duty but would have little effect in reducing domestic production for the domestic market.

The consumption of cigarettes and of cigars (more than that of smoking and chewing tobacco and snuff) is much affected by the buying

power of the population. The estimates of the value of production for the domestic market under the higher income assumption exceed those under the assumption of income as in 1939 by more than 50 percent, part of the excess being attributable to materially higher prices. Since Cuban cigars are a luxury, the consumption of which would probably increase very greatly with high national income, the combined estimates for imports at the high income level exceed the estimates at the lower income level by an even greater percentage than that shown for production for the domestic market.

The preceding summary of estimates does not cover exports. Exports of cigarette leaf tobacco are normally large, and estimates regarding them for the post-war period are presented in the report on cigarette leaf tobacco.

There follows information regarding each of the tobacco items covered in this report.

LEAF TOBACCO (UNSTEMMED) FOR CIGAR WRAPPERS

Tariff paragraph: 601.

Commodity: Leaf tobacco (unstemmed), for cigar wrappers.

Rate of duty: General—\$1.50 per pound; Cuba—\$1.20. Equivalent ad valorem (1939): 88%.

NOTE.—The rate on the Cuban product, \$1.82 per pound under the Tariff Act of 1930, was successively reduced under various trade agreements, the present (1946) rate being 91 cents per pound, effective since January 8, 1942, pursuant to Cuban trade agreement. The general rate, originally \$2.27½ per pound under the tariff act, has been \$1.50 per pound since July 1, 1936, pursuant to the trade agreement with the Netherlands.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production				Imports	Estimated consumption ¹	Ratio of imports to consumption
	Total		For export	For domestic market			
	Farm sales basis	Unstemmed processing equivalent					
Quantity (1,000 pounds).....	11,376	9,373	(9)	9,373	2,180	9,300	Percent 23
Value (\$1,000).....	7,701	7,701	(9)	7,701	\$ 3,661		
Unit value (per pound).....	\$0.68	\$0.82		\$0.82	\$1.67		

¹ Consists of imports plus 7,120,000 pounds of domestic leaf. The estimate for domestic leaf is based on the disappearance of domestic wrapper types of tobacco reported by the U. S. Department of Agriculture; stocks increased materially during the year by reason of the large crop. The value of domestic leaf actually used in 1939 was about \$5,837,000.

² Negligible.

³ Foreign value.

The leaf used for wrapping cigars is a special type of tobacco. Except for a small portion of leaf in the lower grades, wrapper tobacco has no alternative uses. The consumption of wrapper leaf, as a result of the greater output of cigars, increased from 1938 through 1942, but has decreased since, following the trend of cigar production. The tobacco consumed in a specified year does not include any leaf

produced during that year, because tobacco is aged, usually for 2 years or more, before it is used. In this process the weight shrinks about 17-18 percent. The consumption comprises domestic leaf taken from stocks and imported leaf which has been aged before being brought into the country. The estimated consumption of wrapper leaf in the United States indicated above for 1939 has been based on the "disappearance" of domestic wrapper leaf (unstemmed-processing basis, i. e., shrunk-weight equivalent) as reported by the U. S. Department of Agriculture, plus imports for consumption. The crop of 1939 was abnormally large, and much above the consumption of domestic leaf in that year.

The entire domestic production of wrapper tobacco, which is grown under shade in the Connecticut River Valley and in a limited area of Georgia and Florida, is used in this country; exports have been negligible for many years. The range of domestic production has been wide, the greatest annual production on a shrunk-weight basis since 1930 being 9.4 million pounds (11.4 million pounds farm sales weight) in 1939 and the lowest, 5 million pounds (6 million pounds farm sales weight) in 1933. Annual imports during the same period have ranged between 4.2 million pounds in 1932 and 1.7 million pounds for both 1937 and 1938. Sumatra has accounted for roughly 90 percent of the wrapper imported and Cuba has accounted for most of the remainder.

Wrappers affect the appearance and smoking quality of cigars. Once a brand is established the same type of leaf is ordinarily used, regardless of minor fluctuations in cost. Since 1930, manufacturers in developing production formulas have used domestic wrappers in increasing proportion. Thus in recent years the trend has been toward greater use of the domestic product. The proportion of total cigars wrapped with domestic leaf increased from one-half in 1930 to three-fourths in 1939. Cuban leaf has been imported exclusively for use on the comparatively small number of all-Havana cigars made in the United States.

A considerable quantity of Sumatra leaf was shipped into the United States shortly before the fall of Singapore in 1942. Until recently these stocks have been fairly large, but certain grades have now been exhausted, and the remaining supply is being rapidly depleted. As the wrapper industry in Sumatra has probably been greatly disrupted during the Japanese occupation, it is expected that much time will be required to reestablish production sufficient to provide exports of high quality leaf similar to that formerly sent to the United States market. Therefore, Sumatra leaf may not be available to the domestic producer of cigars for some time after the war.

POST-WAR SHORT TERM

With per capita income at a level corresponding to that of 1943, it is possible that the consumption of cigar wrapper tobacco, because of an expansion in the production of cigars, will amount to between 15 and 30 percent above that of 1939. On the assumption that it is unlikely that significant quantities of Sumatra leaf will be brought into the United States during the immediate post-war years, and because imports of wrapper from Cuba, owing to their special use, will be relatively small, nearly all of the wrapper leaf used in the country will have to be of domestic production. Prices are likely to continue to be much higher than in 1939.

POST-WAR LONG TERM**Consumption, Production, and Imports**

It is a reasonable possibility that domestic leaf will constitute a greater proportion of the wrapper tobacco used by cigar manufacturers than it did in 1939; the proportion may become as high as 90 percent and very probably exceed 80 percent.

It is not likely that changes in the rate of duty by as much as 50 percent would alter materially the total consumption of cigar wrapper. They might affect somewhat the ratio of imports to consumption. The effect of changes, however, is so uncertain that no specific estimates of it are offered in the following statement.

Per capita income at 1939 level.

At this level of income, consumption of tobacco for cigar wrappers is likely to be 9.3-10.3 million pounds. This quantity would be in proportion to the probable post-war production of cigars under these conditions as subsequently indicated in this section. If 80-90 percent of the total wrapper leaf used were domestic, the consumption of such leaf would be 7.3-9.3 million pounds, valued (at 1939 unit values) at 6.0-7.6 million dollars. The unshrunk or farm sales weight would be 8.8-11.2 million pounds. With the increase in the proportion of domestic leaf, imports might fall to 1-2 million pounds with a foreign value (at 1939 unit values) of 1.7-3.4 million dollars, or 45-90 percent of the 1939 figures. •

Per capita income 75 percent higher than in 1939.

With the increase in per capita income and in population, total consumption of cigars and, consequently, of cigar wrapper leaf would probably be 50-65 percent higher than in 1939, indicating a consumption of the leaf between 14-15.5 million pounds. If 80-90 percent of this quantity was domestic tobacco, consumption of such tobacco (shrunk-weight basis) would be 11-14 million pounds, corresponding to a farm sales weight of 13-17 million pounds. The unit value would probably be considerably higher than in 1939. On the basis of 1941 prices (average price paid to farmers, 98 cents per pound) the value of the consumption of the domestic tobacco would be about 13-17 million dollars. Notwithstanding the increased total consumption, imports would probably be not much greater than in 1939 and might be appreciably smaller, perhaps 1.5-3.0 million pounds. The foreign unit value of this tobacco, however, would probably be around 40 percent higher than in 1939, so that the range in value of imports might be 3.5-7.0 million dollars, the larger figure being somewhat more likely to be reached if the duty should be reduced by 50 percent.

Exports

Exports of wrapper leaf from the United States are not separately classified in official statistics, but are known to be relatively insignificant. There is little likelihood that they will become important in the future.

Employment

Wrapper tobacco in the United States is produced on about 250 farms, many of them incorporated concerns. Although these farms have year-round employment for some persons, much of the work is

seasonal. Any increase in production probably will be achieved without a corresponding increase in the number of farms, but the level of employment, especially seasonal employment, could be expected to increase in proportion to the production.

CIGARETTE LEAF TOBACCO (UNSTEMMED)

Tariff paragraph: 601.

Commodity: Cigarette leaf tobacco
(unstemmed).

Rate of duty: 30 cents per pound. *Equivalent ad valorem (1939):* 64.5%.

NOTE.—Cigarette leaf tobacco, unstemmed, was dutiable under the Tariff Act of 1930 at 35 cents per pound. The rate was reduced to 30 cents pursuant to the trade agreement with Turkey, effective May 5, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production				Imports	Estimated consumption ²	Ratio of imports to consumption
	Farm sales weight	Unstemmed processing equivalent ¹	For export	For domestic market			
Quantity (million pounds).....	1,599	1,417	264	1,153	50	700	Percent 7.1
Value (million dollars).....	250	250	67	203	24		
Unit value (cents per pound)....	15.6	17.6	25.4	17.6	49.0		

¹ Tobacco is aged, generally at least 2 years, before it is used. During its aging it undergoes certain changes and loses weight. Tobacco production is reported on a farm-sales weight basis, and the unstemmed processing equivalent represents the tobacco as shrunken and ready for use, thus making it readily comparable with consumption, imports, and exports. No tobacco enters manufacture during the year of its production.

² Based on the quantities of leaf (unstemmed basis) used in the manufacture of cigarettes, tobacco, and snuff as reported in the *Annual Report* of the U. S. Commissioner of Internal Revenue. None of the types of tobacco included here is actually used in snuff. About three-fourths of the total was used in the production of cigarettes and the remainder in smoking and chewing tobacco. This consumption was much less than domestic production plus imports minus exports, large quantities being added to stocks. The value of domestic leaf actually used in 1939 was about 114.4 million dollars.

³ Estimated.

⁴ Foreign value.

Tobacco of the light types, frequently referred to as cigarette tobacco because of its principal use, has accounted for four-fifths or more of both the total production and the total exports of domestic tobacco every year since 1935. Cigarette leaf has also been the principal type imported, usually amounting to about two-thirds of the total in quantity and value.

In the above table the statistics for consumption (estimated actual consumption, not "apparent") and imports relating to 1939 are fairly representative of the immediate pre-war period. The statistics of production are entirely unrepresentative. Not only was the crop of 1939 exceptionally large, so that large quantities were added to stocks, but also, for some years preceding 1939, production exceeded consumption plus exports, so that stocks were being accumulated. As a basis for estimating the post-war production of cigarette leaf tobacco in the United States, the significant pre-war figures are the actual domestic consumption of domestic leaf and the exports. The consumption of domestic leaf in 1939 was 650 million pounds¹ (total

¹ All figures in this report are on a shrunken-weight basis; if reconverted to farm-weight basis the quantities would be about 13 percent larger and the unit values 12 percent smaller.

consumption minus imports of 50 million), and this was approximately the average figure for the period 1936-40. Throughout that period, imported tobacco accounted for about 7 percent of the consumption (which averaged about 700 million pounds) and domestic tobacco for about 93 percent.

The domestic cigarette tobaccos (the light tobaccos) comprise flue-cured, Burley, and Southern Maryland types. Of the total production of light types for the period 1938-42, flue-cured leaf accounted for about 68 percent, Burley for 29 percent, and Southern Maryland for about 3 percent. North Carolina is the leading producing State; Kentucky, Virginia, Tennessee, South Carolina, Georgia, and Maryland are also important.

The imported cigarette tobacco, commonly called Turkish, comes mostly from Turkey and Greece, with some from other eastern Mediterranean countries.

The great bulk of the light leaf used in the United States is manufactured into cigarettes, which accounted for about 75 percent of the consumption in the period 1936-40. The remainder is used in smoking and chewing tobaccos, in which it is much the largest constituent.

For a long period before the war the consumption of cigarettes showed a strong general upward trend, and this carried with it a decided upward movement in the consumption of cigarette leaf, notwithstanding the fact that the quantity of such leaf used in other forms of manufactured tobacco was stationary or declining.

Practically all cigarettes manufactured in the United States for consumption here are composed of blends comprising all three of the types of domestic leaf above mentioned and in most cases including some imported leaf. During the immediate pre-war period about 10 percent of the leaf used in cigarettes was imported; the proportion in those years was considerably lower than in earlier decades. Turkish tobacco has distinct qualities of aroma and flavor, and cigarette manufacturers find it advantageous to include a certain proportion with the domestic leaf.

Consumption of cigarettes, and consequently of cigarette leaf tobacco, has been exceptionally high during the present war. However, imported leaf has represented a smaller proportion of the total cigarette leaf consumed in the United States. While the consumption of domestic cigarette leaf has increased greatly, imports have remained near pre-war levels. On the other hand, exports of domestic leaf were much smaller than before the war, until 1943, when they again reached pre-war levels.

POST-WAR SHORT TERM

The annual per capita consumption of cigarettes may decline somewhat as compared with the exceptionally high war figures, but will probably remain well above the 1939 consumption. The total quantity of cigarette leaf consumed by manufacturers both of cigarettes and of other tobacco products may be a third greater than in 1939. Turkish tobacco imports are likely also to be considerably greater than during the war, and may approximate the same proportion of the total consumption as in immediate pre-war years.

Because of wartime shortages of tobacco in the major European countries, exports may be much higher than before the war. Consequently the total production of domestic cigarette types is likely to be large.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

In view of the general upward trend in the per capita consumption of cigarettes, the consumption in the long-term post-war period may approximate 1,600 cigarettes per capita, as compared with 1,318 in 1939. The consumption of light leaf in smoking and chewing mixtures, which has shown a general downward trend, is likely to be less per capita than in 1939. In view of the increase in population, it is probable that the domestic consumption of all cigarette-type tobacco, domestic and imported, will be about 25 percent greater than in 1939, or in the neighborhood of 875 million pounds. Although the quantity of imports may be considerably affected by changes of duty of as much as 50 percent, the effect on total consumption of cigarette leaf would be too small to warrant separate estimates; it might be 1 or 2 percent greater with a reduction in the duty, or 1 or 2 percent less with an increase in the duty, than with the duty as in 1939. The consumption of domestic leaf would be affected to only about the same extent by duty changes. It is likely to be in the neighborhood of 800-810 million pounds, with a value, at a unit price probably about 22½ cents (higher than the unusually low price in 1939, which was 17.6 cents per pound), in the neighborhood of 180 million dollars. Estimates of exports and of total production of domestic leaf are shown in a subsequent section.

Duty as in 1939.—Imports would probably be about the same percentage of consumption as in the pre-war period, namely 7 percent, in which case they would amount to around 60 million pounds. The foreign unit value would probably be somewhat lower than in 1939 (49 cents) when it was above the pre-war average. It might be approximately 45 cents per pound, with a resultant total foreign value of imports in the neighborhood of 27 million dollars.

Duty reduced by 50 percent.—The reduction of the duty from the present rate of 30 cents to 15 cents per pound would tend to reduce materially the duty-paid price of Turkish tobacco, and hence would tend to increase the consumption of it. However, part of the reduction in duty would probably be absorbed by the foreign producers in higher foreign prices. The imports might be 20 to 30 percent greater in quantity than with no reduction in duty, amounting perhaps to 75 million pounds. Greater increase in imports would probably be prevented by consumer preference; the admixture of a much larger proportion of Turkish tobacco than is now customary would change the flavor of the cigarettes and would probably not be welcomed. If the foreign price should average, say, 5 cents per pound higher than with no change in duty, the foreign value of the imports would be about 37.5 million dollars.

Duty increased by 50 percent.—An increase in the duty would reduce imports, though the effect would be less marked than that of a reduction in the duty, because of the more or less inelastic demand for the Turkish tobacco. The quantity might fall to 55 million pounds. The

foreign average unit value would probably also fall somewhat, possibly to as low as 40 cents per pound. On that basis the value of the imports would be about 22 million dollars.

Per capita income 75 percent higher than in 1939.

Although the demand for cigarettes is comparatively inelastic, an increase of as much as 75 percent in per capita income might well result in a per capita consumption approximately one-fourth greater than with no change in income. On the other hand, high income would tend to reduce consumption of smoking and chewing tobacco, and of the cigarette leaf which enters into them. Taking both factors into consideration, it is probable that the consumption of cigarette leaf would be between 15 and 20 percent greater than with no increase in income. It might amount to about 1 billion pounds, assuming no change in the rate of duty, and might perhaps be 1 or 2 percent more if the duty should be reduced, and 1 or 2 percent less if the duty should be increased. Domestic leaf would constitute somewhere between 90 and 93 percent of this consumption, amounting to somewhat more than 900 million pounds. The average unit price of domestic leaf would presumably be considerably higher than with income at 1939 levels. It might amount to approximately 34 cents per pound, a price nearly twice as high as the unusually low unit value of 1939, but considerably less than the value in the years since 1941. The value of the domestic leaf consumed would thus be in the neighborhood of 305 million dollars.

Duty as in 1939.—Turkish leaf would probably constitute about the same proportion of the consumption as in the pre-war period, about 7 percent, and imports might therefore amount to about 70 million pounds, with a foreign value, at an average price considerably higher than would prevail with no change in income (say 60 cents per pound), amounting to nearly 42 million dollars.

Duty reduced by 50 percent.—The imports might be 20 to 30 percent greater than with no change in duty, and might amount to 85–90 million pounds. The foreign unit value would probably be somewhat higher than with no change in duty, perhaps 65 cents, and the total value of the imports might be 55–59 million dollars.

Duty increased by 50 percent.—The imports might be about 10 percent less than with no change in duty, amounting perhaps to 60–65 million pounds. The foreign unit price would also be somewhat less, say, 55 cents, so that the total value might be 33–36 million dollars.

Exports and Total Domestic Production

Since exports normally constitute about one-third of the domestic production of cigarette leaf tobacco, no estimates of total production of such tobacco have been made in the preceding sections, which deal with consumption of domestic tobacco and with imports. Normally the United Kingdom is much the most important export market, and takes the higher priced grades; China ranks next, buying for the most part leaf of low grades. The expansion of exports to the United Kingdom during the pre-war period was checked in considerable measure by duty preferences granted by that country to Empire tobacco. Notwithstanding these preferences, however, the United States continued to be by far the principal source of the steadily increasing total imports into the United Kingdom.

In connection with the trade agreement with the United Kingdom, effective January 1, 1939, that country undertook to negotiate with Empire countries with reference to a reduction in the amount of the preference for Empire tobacco. In 1943 the extent of the preference was somewhat reduced. It is impossible to forecast what may be the effect of this action on exports from the United States in post-war years, assuming that no other change in United Kingdom duties takes place.

Another consideration that may affect exports of domestic cigarette tobacco is the steady expansion, even during the war years, of the production and export of types like or similar to those produced in the United States in certain foreign countries, particularly Canada, India, and Rhodesia. It is possible that their production will increase further after the war.

If world income levels are assumed to be about the same as those in 1939, it is reasonably possible that exports in the long period may be considerably smaller than in the pre-war period. They might be no more than 250 million pounds. This quantity, together with the 800 million pounds previously estimated for consumption, would indicate a total domestic production in the neighborhood of 1,050 million pounds, with a value of perhaps 235 million dollars.

Were there a marked reduction in foreign tariffs and other trade barriers impeding United States exports of cigarette leaf (say, by half), the exports, even on the same assumption as to world income (i. e. at the 1939 level), would probably increase substantially, possibly to as much as 275-300 million pounds. There seems little likelihood of a general increase in foreign duties on leaf tobacco; if it should occur, the reduction in actual quantities exported would probably not be great unless the duty increases were very large; but the dollar receipts from exports might decline in greater proportion.

If national income in the United States should be 75 percent higher than in 1939, it may be assumed that income in foreign countries would also be much higher than before the war. In that case the consumption of cigarettes, and consequently of cigarette leaf tobacco, in foreign countries which are markets for United States exports, would probably be 20 to 25 percent greater than with no change in world income. On this assumption, exports from the United States might be 300-325 million pounds, if present rates of duty and other trade barriers in the foreign countries remained unchanged. Total domestic production (consumption of domestic leaf plus exports) in that case would be 1,200-1,225 million pounds, with a value of 410-415 million dollars.

The above figure of exports might be 10 to 20 percent greater if duties and other trade barriers in foreign countries were markedly reduced; they would be somewhat smaller if such barriers were increased.

Employment

The tobacco of the cigarette types is, in general, raised on comparatively small acreages. Frequently it is the major enterprise on a farm and often is the only source of cash income. Any extra labor involved by additional production would in most cases be supplied through increased family effort. Because it is estimated that 454 man-hours

are required to produce an acre of flue-cured tobacco, and 304 man-hours, an acre of the other cigarette types, it follows that the total labor requirement for the unusually large 1939 crop was about 80 million eight-hour man-days. On the basis of the estimates of United States production made, the labor requirements for the long-term post-war period would range between 64-75 million 8-hour man-days.

TOBACCO FOR CIGAR FILLERS

Tariff paragraph	Commodity	General (Per lb.)	Cuba (Per lb.)	Philippine Islands	Equivalent ad valorem (1939) on dutiable imports from Cuba only (Percent)
601-----	Tobacco for cigar fillers, unstemmed.	35¢	28¢	Free-----	52
601-----	Tobacco for cigar fillers, stemmed.	50¢	40¢	Free-----	60
603-----	Tobacco for cigar fillers, scrap.	35¢	28¢	Free-----	103
Average-----					63

NOTE.—Cuban unstemmed cigar filler and scrap tobacco, were dutiable under the Tariff Act of 1930 at the preferential rate of 28 cents per pound. The rate on stemmed cigar filler was 40 cents per pound. These rates were reduced to 17½ cents and 25 cents, respectively, effective September 3, 1934, pursuant to the Cuban trade agreement, and the reduced rates remained in effect, subject to an absolute quota on Cuban tobacco products, until March 17, 1936, when the former rates were restored. The reduced rates were once more made effective December 22, 1939, on a tariff-quota basis of 22 million pounds (unstemmed equivalent); on January 5, 1942, the rates were further reduced to 14 cents on unstemmed cigar filler and scrap tobacco and to 20 cents on stemmed cigar filler, with a continuation of the existing tariff quotas.

Philippine cigar filler and scrap tobacco, free of duty under the Tariff Act of 1930, were made subject to a duty-free quota of 4.5 million pounds for the calendar year 1940, with successive reductions during the following years until Philippine independence, after which the Philippine product would become subject to regular United States tariff duties. (Act of Aug. 7, 1939, amending sec. 6 of the Philippine Independence Act.)

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production				Imports		Estimated consumption ⁴	Ratio of imports to consumption
	Farm sales basis ¹	Unstemmed processing equivalent ²	For export ³	For domestic market	Actual weight basis	Unstemmed equivalent		
Quantity (1,000 pounds).....	76,880	61,887	1,497	60,390	27,265	35,043	97,500	Percent
Value (\$1,000).....	9,860	9,860	463	9,602	8,867	8,867		87
Unit value (cents per pound).....	12.8	15.9	30.9	15.9	32.5	24.9		

¹ Represents mainland production of 63,055,000 pounds, valued at \$7,372,000 (11.7 cents per pound); and Puerto Rican production, 13,825,000 pounds, \$2,488,000 (18 cents per pound).

² Represents quantity suitable for use after shrinkage during aging.

³ All types of cigar leaf.

⁴ The estimated consumption comprised 67.0 million pounds of domestic filler plus 17.3 million pounds of Cuban and 13.2 million pounds of Philippine tobacco. Of the total, 91-92 million pounds were used in the manufacture of cigars. For domestic filler the estimated consumption is based on disappearance data reported by the U. S. Department of Agriculture; the figure for Cuba represents imports for consumption in 1939; for Philippine tobacco, imports were adjusted on the basis of year-end changes in stocks. The value of domestic leaf actually used in 1939 was about \$10,720,000.

⁵ Imported tobacco actually consumed in 1939 supplied about 31 percent of the total; dutiable tobacco supplied about 18 percent of total consumption.

⁶ Estimated.

⁷ Foreign value.

The imports in 1939 were as follows (there were no imports, except from Cuba and the Philippines):

Composition	Cuba			Philippine Islands		
	Quantity	Value	Unit value	Quantity	Value	Unit value
	1,000 pounds	1,000 dollars	Cents per pound	1,000 pounds	1,000 dollars	Cents per pound
Unstemmed filler.....	2,187	1,181	54.0	29	3	10.3
Stemmed filler.....	8,200	8,466	66.7	13,706	1,369	9.9
Scrap.....	3,163	858	27.1			
Total.....	13,550	7,505		13,735	1,362	
Unstemmed equivalent.....	17,336	7,505	43.3	18,907	1,362	7.4

Cigar-filler tobacco is used primarily for the core of cigars, and on an average represents three-fourths of the weight of cigars. The filler used determines to a large extent the flavor and aroma of the cigar. The greater part of that used in the United States is domestic, being produced in the States of Pennsylvania and Ohio, and in Puerto Rico. Certain grades of the cigar-filler types have alternative uses, and varying quantities are exported. The most important source of imported filler is Cuba, but before the war considerable quantities, usually in the form of scrap (byproduct of the Philippine cigar industry), were supplied by the Philippine Islands. In 1939 the domestic consumption of filler tobacco was higher than usual and is estimated to have been approximately 97.5 million pounds (unstemmed equivalent). This total included an exceptionally large quantity of Philippine tobacco, between 2 and 3 times as much as in most years before or after 1939. During the period 1936-40, the annual consumption of tobacco of the filler types averaged about 91 million pounds, of which domestic (including Puerto Rican) leaf accounted for about 70 percent.

Domestic production, particularly that of Puerto Rico, has been characterized by wide annual fluctuations. For 1938 and 1939 mainland production, on a farm-sales weight basis, amounted to 52 million and 63 million pounds, respectively; Puerto Rican, 44 million and 14 million pounds. The average annual production for the years 1936-40 was 56 million pounds on the mainland and 29 million pounds in Puerto Rico. The combined total thus averaged 85 million pounds, farm basis, equivalent to about 69 million pounds, unstemmed shrunk weight. Usually about 90 percent of the Puerto Rican production is used in the continental United States.

Despite the year-to-year differences in relation of the mainland and Puerto Rico to each other in production, there is a fairly constant relationship between the consumption of the two types, because in cigar production filler tobaccos from different sources are blended in accordance with established formulas.

Large quantities of Cuban filler tobacco are regularly imported; in 1939 they amounted to 17.3 million pounds (unstemmed basis); the average for 1936-40 was 17.2 million pounds. The aroma and flavor of Cuban tobacco have long been associated with fine cigars,

and the inclusion of some Havana filler is considered necessary in most cigars. The quantity used varies between brands, ranging from a very small portion in some cigars to the total in all-Havana cigars. Because all-Havana cigars constitute a relatively small portion of the total produced, the demand for Cuban leaf is largely determined by the extent of its use in blended cigars. Unlike Cuban leaf, Philippine cigar filler, most of it scrap tobacco, has ordinarily been used only in cheap cigars. In 1939 the imports from the Philippines amounted to 18.3 million pounds (unstemmed basis), a far larger figure than in any other year since the First World War. The average for 1936-40 was about 7 million pounds.

There is a wide range of prices for the different types of cigar filler tobacco. Cuban filler because of inherent qualities ordinarily commands the highest prices. In 1939 the average foreign value of the imports from Cuba was 43 cents per pound on an unstemmed basis. The filler tobacco from the Philippine Islands had a foreign value of 7.4 cents per pound on an unstemmed basis. The Puerto Rican filler brought to the United States in 1939 had an average island value, in terms of unstemmed leaf, of 26 cents per pound. For continental types of filler tobacco comparable price data are not available, but it is estimated that the average unstemmed value of these filler tobaccos used in 1939 was between 16 and 18 cents per pound.

Important wartime changes affecting consumption are the cessation of supplies from the Philippine Islands and the sharp increase in the imports from Cuba. The latter has been caused in part by the trend toward increased production of higher-priced cigars, which utilize relatively large quantities of Cuban filler. The tariff quota of 22 million pounds (unstemmed equivalent) on imports from Cuba at a reduced duty was exceeded for the first time in 1942, and since then imports have been materially in excess of the quota each year, the excess paying the higher rates of duty shown at the beginning of this report (Cuba column).

POST-WAR SHORT TERM

The increase in cigar production over that of 1939, anticipated because of a high level of income, indicates that the total consumption of filler tobacco will probably be between 15 and 30 percent above the 1936-40 average. Probably the relative quantities of Cuban leaf will be somewhat higher than before the war, as a decided increase, over pre-war figures, in the demand for all-Havana (domestic-made) cigars may occur. To what extent Philippine tobacco will be available is not known. If available, the volume of imports would depend largely on the duty status of tobacco from the Philippines. Application of the general rates in accordance with the terms of the Philippine Independence Act would result in almost total exclusion of Philippine tobacco. Even if entered free, it is doubtful if it would be used in as large quantities as in 1936-40 (to say nothing of the abnormal figure for 1939) because the demand for low-priced cigars seems likely to be relatively smaller.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

If the long-time downward trend in the consumption of cigars (except during periods of high consumer income) should continue, the quantity of filler tobacco used, even allowing for an increase in population, might be no greater, possibly even less, than the average for the period 1936-40 (91 million pounds). On the other hand, this downward trend may have run its course; the increased demand for cigars during the early war years may not have been due entirely to rising national income. If this proves to be true, consumption of filler tobacco, with a per capita income the same as in 1939, might be around 10 percent greater than the pre-war average as the result of greater population, amounting to, say, 100 million pounds.

In the following estimates regarding imports and domestic production under the several assumptions regarding the rate of duty, it is assumed that, in accordance with the provisions of the Philippine Independence Act, imports from the Philippines will be subject to the general rates of duty applicable to imports from all other countries except Cuba, which has a preferential rate. As already pointed out in the general introduction, one of the subjects which will presumably be considered by the Filipino Rehabilitation Commission, recently established, will be the possibility of some modification of the Philippine Independence Act with respect to the application of United States duties to imports from the Philippines. Even if the general rates of duty on cigar-filler leaf tobacco should be reduced by 50 percent, it is improbable that there would be any significant imports from the Philippines if they were subject to these duties.

Duty as in 1939.—On this assumption imports from Cuba would probably be 16-20 million pounds (unstemmed weight), with a foreign value of 6.9-8.6 million dollars. Assuming practically no imports from the Philippines, domestic production would be 71-84 million pounds. The average unit value of the domestic product would probably be not very different from the 1939 figure of about 16 cents per pound. Consequently, the value of the domestic production would be 11.3-13.4 million dollars. If any arrangement should then be in effect which would permit considerable imports of tobacco from the Philippines, the domestic production would be appreciably smaller in quantity and slightly smaller in value.

Duty reduced by 50 percent.—The reduction of the duty on Cuban filler by 50 percent below the rate in effect before December 23, 1939¹ (the rate averaging 63 percent ad valorem in 1939), might increase somewhat the total consumption of cigar filler leaf, domestic and imported, since the duty-paid price of the imported product would undoubtedly be materially lower than with an unchanged duty and the price of the domestic product probably slightly lower. It is frequently contended by cigar manufacturers that if Cuban filler were available at lower prices, so much more would be used in medium- and low-priced cigars that the consequent improvement in the quality would increase consumption of such cigars sufficiently to bring about a greater consumption of domestic cigar-filler tobacco than would otherwise occur. While there might be a tendency in this direction,

¹ See note regarding present duties, subject to quota, at the beginning of this section.

it is impossible to estimate the magnitude of the effect, and in the present section it is assumed that the increase in the imports of Cuban tobacco which would follow a reduction in the duty would be accompanied by some decrease (though not by the full amount) in the consumption of the domestic leaf. The result might be a total consumption of 93-103 million pounds, or 2-3 percent greater than with no reduction in duty.

The extent to which imports from Cuba would increase as the result of a reduction in duty would, of course, depend upon the amount by which the duty-paid price of the Cuban product would be lowered. It is conceivable that the Cuban producers (particularly if strongly organized or aided by government action) would raise the price in Cuba by the full amount of the reduction in the duty, in which case there would be no tendency to increase the imports. At the other extreme, the Cuban producers might not increase their price at all, in which case the advantage in costs to American cigar manufacturers resulting from the reduction in the duty would have the full impact upon imports. In this report it is assumed that the Cuban producers would advance their price by a fraction (much less than half) of the amount of the reduction in the duty, say from 43 cents per pound (taken as the price with no change in duty) to about 46 cents. On this assumption regarding prices, the quantity of imports from Cuba would probably be about one-fourth greater than with no reduction in the duty, amounting to, say, 20-25 million pounds. Probably the quantity of domestic production would be lessened only slightly by such an increase in the imports from Cuba. If Philippine tobacco were dutiable, even a reduction of 50 percent in the rates would scarcely permit any imports from that source.

Assuming the foreign price of the Cuban tobacco to rise from 43 to 46 cents per pound as the result of the reduction in the duty, the value of imports from Cuba would be between 9.2-11.5 million dollars. Assuming the price of domestic tobacco to fall from 16 to 15½ cents per pound, by reason of the reduction in duty, the value of the domestic production (assuming no imports from the Philippines) would be between 10.5-12.9 million dollars.

Duty increased by 50 percent.—Reversing the reasoning presented in the preceding paragraph, imports from Cuba might be somewhat less in quantity, and at a somewhat lower foreign unit price, than if the duty should remain unchanged. The consumption of domestic and imported leaf might be slightly smaller than with an unchanged duty. Conversely, the domestic production might be slightly greater and the unit price of the domestic product slightly higher. Estimates of the resulting consumption, imports, and domestic production, in quantity and value, are shown in the table below.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—The per capita consumption of cigars tends to increase materially as consumer income rises. With no change in duty the per capita consumption of cigar filler tobacco might be as much as 50 percent greater than with no change in income, totaling perhaps 135-150 million pounds.

Since high national income would presumably increase the proportion of the higher priced cigars in consumption, the increase in the imports of Cuban filler tobacco would probably be greater, percentage-wise, than the increase in consumption of domestic tobacco. Imports

from Cuba might rise to 28-33 million pounds (unstemmed equivalent). In that case, assuming no imports from the Philippines, domestic production might be about 102-122 million pounds. Presumably with higher national income the foreign price of Cuban tobacco and the price of domestic tobacco would be somewhat higher than under the lower national income. The prices under the higher level might be 15-20 percent more than under the lower level.

Duty reduced by 50 percent.—The effects of a reduction in the duty on total consumption, on imports from Cuba, and on domestic production would probably parallel those already set forth in the discussion of conditions with national income as in 1939. Consumption would be somewhat greater, imports considerably greater, and domestic production somewhat less under the reduced duty than with an unchanged duty.

Duty increased by 50 percent.—The effects of an increase in the duty would be more or less the reverse of the effects of a reduction in the duty. Following the same general procedure as in the estimates based on an unchanged national income, estimates are presented in the table regarding the quantities, unit prices, and values of consumption, imports, and production under this assumption regarding the rate of duty.

Estimates (following the general methods already described) of the quantities, prices, and values on both assumptions as to the level of income are presented in the following table:

Cigar filler tobacco: Estimates of United States consumption, production, and imports under the assumptions of Senate Resolution 341

[Unstemmed equivalent]

Period, income level, and tariff treatment	Consumption	Production			Imports from Cuba ¹		
		Quantity	Unit value	Value	Quantity	Unit value	Value
	Million pounds	Million pounds	Cents per pound	Million dollars	Million pounds	Cents per pound	Million dollars
Average, 1936-40.....	91	67	16	10.7	17	43	7.5
Per capita national income same as in 1939:							
Duty as in 1939.....	91-100	71-84	16	11.3-13.4	16-20	43	6.9-8.6
Duty reduced by 50 percent.....	93-103	68-83	15½	10.5-12.9	20-25	46	9.2-11.5
Duty increased by 50 percent.....	90-99	72-85	16½	11.9-14.0	14-18	40	5.6-7.2
Per capita national income 75 percent above 1939:							
Duty as in 1939.....	135-150	102-122	18	18.4-22.0	28-33	50	14.0-16.5
Duty reduced by 50 percent.....	138-164	98-121	17½	17.1-21.2	33-40	54	17.8-21.6
Duty increased by 50 percent.....	133-148	103-123	18½	19.0-22.8	25-30	46	11.5-13.8

¹ It is assumed that imports from the Philippines would be insignificant or nil. (See text.)

² Approximate 1939 price.

Exports

No separate classifications are made by type of the domestic cigar tobacco entering world trade, but it is known to consist chiefly of filler leaf. The quantity of all cigar leaf exports is small compared with both the production of cigar tobacco and exports of all tobacco. Frequently exports have been less than 1 million pounds and have exceeded 2 million pounds in only 1 year since 1935. The value has been less than 1 million dollars a year. There is little expectancy that cigar leaf will be an important export type of tobacco.

Employment

Much of the filler tobacco is produced on general farms, and its production frequently constitutes one enterprise among several. As such it utilizes the regular farm labor and some seasonal workers. Increases in production would probably take place on the farms where it is ordinarily grown. As the average labor requirement to produce an acre of cigar filler in the United States mainland is estimated to be 293 man-hours, the 1939 crop of 48,800 acres represented an equivalent of about 1.8 million man-days of 8 hours each. In Puerto Rico it is chiefly produced by 22,000-23,000 small farmers on relatively small plots of land and is often the only cash crop of the farmer. No data are available relating to the labor requirements of Puerto Rican production.

SMOKING AND CHEWING TOBACCO AND SNUFF

Tariff paragraph	Commodity	Rate of duty (Per pound)	Equivalent ad valorem (1939) (Percent)
604	Snuff and snuff flour	55¢	39. 6
603	Manufactured tobacco, n. s. p. f.	35¢	19. 1
Average			20. 8

NOTE.—Manufactured tobacco, n. s. p. f., was dutiable under the Tariff Act of 1930 at the rate of 55 cents per pound. That rate was reduced pursuant to the trade agreement with the United Kingdom, effective January 1, 1939, to 35 cents per pound.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds)	343,307	3,868	339,439	150	339,589	Percent Less than 0. 5
Value (\$1,000) ¹	156,205	1,943	154,262	1,267		
Unit value (cents per pound)	45. 5	50. 2	45. 4	178. 0		
Persons employed (number)	9,200					

¹ Excise tax not included.

² Estimated.

³ Foreign value.

The manufactures of tobacco considered here consist of smoking tobacco, chewing tobacco, and snuff and, in general, are relatively low-priced products. In 1939 the total domestic consumption of these products totaled 340 million pounds or, on a per capita basis, 2.60 pounds, of which smoking tobacco accounted for 1.53 pounds; chewing tobacco, 0.78 pound; and snuff, 0.29 pound. Although there has been some year-to-year variation in quantities consumed, the long-time pre-war trend was downward chiefly because of increasing consumer preference for cigarettes. In 1943, notwithstanding consumer buying power much higher than in 1939, the per capita consumption of these products was 2.24 pounds, or about 15 percent less than in 1939.

During the period 1935-42 the total domestic production of these tobacco manufactures ranged between 330 million and 348 million pounds. An average of about 4 million pounds has been exported annually. The amount of leaf tobacco used in these products had declined every year since 1935 both in quantity and in relation to the leaf used in other products. In 1935 the quantity reported as used was 263 million pounds and amounted to 34 percent of the total leaf used in the tobacco industry; in 1943, 232 million pounds were used, which accounted for 19 percent of the total. The downward trend of consumption of these kinds of tobacco as a group is likely to continue during the post-war years. This is probable even though the per capita consumption of snuff and chewing tobacco has increased somewhat during the war years, partly because smoking has been prohibited in many war plants.

The imports of these products have never been large. The small quantities entered have consisted mostly of special products such as comparatively high-priced English blends of smoking tobacco and special types sought by orientals. The volume of trade has shown little tendency to vary in response to moderate changes in prices.

POST-WAR SHORT TERM

Per capita consumption of these manufactured tobacco products will probably not be above that of 1943 and may be below that level. Inclusive of possible exports, domestic production may be about 90 percent of that of 1939. With unit values about 15 percent above those of 1939, the total value would probably be somewhat above the 1939 total. The quantity of imports will probably not exceed those of 1939 and may about equal them, with a foreign value slightly greater than that of 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

By reason of the downward trend in the per capita consumption, total consumption, even with a 10 percent greater population may be somewhat less than in 1939 or about 325 million pounds annually. Production (including exports) would not be expected to exceed 330 million pounds; at 1939 prices the value would be about 150 million dollars. Because they consist largely of specialties, the demand for the imported products may remain fairly constant at 150,000 pounds and, owing to the relatively inelastic demand for these types, imports would probably not be greatly affected by a 50 percent change in duty. At 1939 prices the foreign value of total imports would be about \$270,000.

Per capita income 75 percent higher than in 1939.

The downward trend in consumption of these products might be accentuated, rather than lessened, by the greatly increased per capita income here assumed, since many consumers would turn from them to cigarettes and cigars. In this event total consumption might total 310 million pounds, and production, including that for export, might be in the neighborhood of 315 million pounds. Prices of a product

which is declining in popularity would be expected to increase less than prices of commodities in general; they might, however, average about 50 cents per pound—at which figure domestic production would have a value of approximately 155 million dollars. Because of the smaller demand for these products, total imports might amount to somewhat less than in 1939 or about 140,000 pounds with a foreign value of, say, \$275,000. Imports are not likely to be greatly affected by even as much as 50 percent changes in duty.

Exports

The exports of manufactured tobacco are not particularly important in terms of the industry as a whole. The Philippine Islands, Argentina, and Australia have been the most important markets, and small amounts have gone to a large number of other countries. There is little probability that exports of these products will exceed 5 million pounds.

Employment

The tobacco manufacturing industry is highly mechanized and the number employed has been gradually reduced. It appears doubtful therefore that the industry will employ more than 9,000 persons in the future.

CIGARS

Tariff paragraph: 605
 Commodity: Cigars
 Rate of duty: General—\$4.50 per lb. } Equivalent ad valorem (1939): 67.5%.
 +25% ad valorem;
 Cuba—\$3.60 per lb. }
 +20% ad valorem.)
 Philippine Islands—free

NOTE.—The preferential rate on Cuban cigars, \$3.60 per pound plus 20 percent ad valorem under the Tariff Act of 1930, was reduced to \$2.25 plus 12½ percent, effective September 3, 1934, subject to an absolute quota on all Cuban tobacco and tobacco products. On March 17, 1936, the original rate was restored and the quota restrictions removed; on December 23, 1939, the reduced rate of \$2.25 plus 12½ percent again became effective, without quota restrictions, and on January 5, 1942, the rate was further reduced to \$1.80 per pound plus 10 percent ad valorem. These changes were effected pursuant to trade agreements with Cuba, effective September 3, 1934, December 23, 1939, and January 5, 1942. Philippine cigars, free of duty under the Tariff Act of 1930, were made subject to a duty-free quota of 200 million cigars in 1940, with provision for successive reduction by 5 percent for each following year until independence, entries in excess being subject to full United States duties. By amendatory legislation, quota for 1940 remained applicable for 1941 and 1942.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 cigars).....	5,292,570	5,443	5,287,127	202,256	5,489,383	Percent 3.7
Value (\$1,000).....	155,000	330	154,670	3,341		
Unit value (cents per cigar).....	2.93	6.06	2.93	1.65		
Persons employed (number).....	51,000					

¹ Estimated; excise tax not included.
² Foreign value.

The composition of United States imports of cigars for 1939, and the relation of the duty to their value is shown below:

Source	Quantity		Foreign value		Calculated duty		
	Number	Weight	Total	Per cigar	Total	Per cigar	Ad valorem equivalent
	Thousand	1,000 pounds	1,000 dollars	Cents	1,000 dollars	Cents	Percent
Philippine Islands.....	199,217	3,708	3,008	1.51	¹ Free	¹ Free	¹ Free
Cuba.....	2,917	43	330	11.31	221	7.58	67
All other.....	122	1	3	2.46	3	2.46	100
Total, or average.....	202,256	3,750	3,341	1.65	224	-----	-----

¹ Had imports from the Philippine Islands been dutiable at general rates, the duty per cigar would have been between 8 and 9 cents, and the ad valorem equivalent would have been nearly 600 percent.

Although there was a general downward trend in the consumption of cigars, particularly apparent since 1920, when the per capita consumption was about 80 cigars, there is a tendency for consumption to increase when consumer incomes rise. In line with the upward trend in incomes the per capita consumption increased from 41 cigars in 1938 to 46 cigars in 1942. By 1943, however, consumption receded because of the reduced output resulting principally from labor shortages. With limited production, high-priced cigars have represented an increased proportion of the output. Cigars made to retail at more than 8 cents each amounted to 10 percent of the total production in 1939, 22 percent in 1943, and about 40 percent in 1944.

In 1939 the domestic cigar industry supplied about 96 percent of the consumption. Before the war 99 percent of the total imports, in number, consisted of duty-free cigars from the Philippine Islands. Exports were small.

The duty on Cuban cigars in 1939 (subsequently reduced) was about eight times the duty on an equivalent amount of Cuban cigar leaf (also subsequently reduced). This difference in the duty is the chief reason why the imports of cigars from Cuba have normally been small and have consisted chiefly of cigars high in price and prestige value. During the war, however, because of the shortage in this country and high per capita buying power, imports from Cuba (less than 3 million in 1939) increased to 11 million in 1943 and several fold above that level in 1944.

POST-WAR SHORT TERM

During the years immediately after the war, consumption of cigars will probably be from 15 to 30 percent greater than in 1939. Though it is likely that a smaller proportion of high-priced cigars will be produced domestically than in 1943 and 1944, the proportion may be higher than in 1939. The value of the cigars produced may range from 40 to 65 percent more than 1939. Imports from Cuba will probably fall off from their wartime peak, but may still be several times greater than in 1939; even so they will presumably constitute, in number, less than 1 percent of consumption. If imports are subject to the full rate of duty beginning in 1946 as provided in the Philippine Independence Act, imports of the low-priced type usually brought in from the Philippines would be virtually excluded.

POST-WAR LONG TERM

Consumption, Production, and Imports

The following estimates of imports in the post-war period are based on the assumption that Philippine cigars, in accordance with the provisions of the Philippine Independence Act, will in the long-term post-war period be subject to the full general rates of duty. Even if the general rates should be reduced by 50 percent, there is little likelihood that any significant quantity of Philippine cigars would be imported. As already pointed out in the general introduction, one of the subjects which will presumably be considered by the Filipino Rehabilitation Commission recently established will be the possibility of some modification of the Philippine Independence Act with respect to the application of United States duties to imports from the Philippines. Since the duty on cigars is in part specific—so much per pound regardless of price—imports from the Philippines, which consist of very cheap cigars, would be possible only at a small fraction of the 1939 rate of duty.

Per capita income at 1939 level.

It seems likely that (assuming no change in income levels) the downward trend in per capita consumption of cigars which occurred between the two wars will be less conspicuous hereafter. Nevertheless, the trend may be sufficient to offset the effect of growth of population, and conceivably even to cause some decrease in the total consumption. Consumption might thus range from about 5.3 billion to 6.0 billion cigars, worth at approximately 1939 prices, from 155 million to 175 million dollars. Domestic production would represent more than 99 percent of the consumption if Philippine cigars were dutiable.

Duty as in 1939.—It is probable that the imports from Cuba would be somewhat less than in 1939, because of the general downward trend in the consumption of cigars. They might amount to about 3 million cigars with a foreign value around \$300,000. If imports of cigars from the Philippines were virtually nil, domestic production would be substantially equal in quantity and value to the total consumption as above estimated.

Duty reduced by 50 percent.—Imports from Cuba would probably be considerably larger than with an unchanged duty but would not be likely to exceed 5 million cigars with a foreign value of about \$500,000. This increase in imports would have only a small effect upon the quantity or value of domestic production.

Duty increased by 50 percent.—Imports might be about one-third smaller than with the duty as in 1939; they might amount to about 2 million cigars, with a foreign value of approximately \$200,000. Domestic production would not be significantly greater by reason of this reduction in imports from Cuba.

Per capita income 75 percent higher than in 1939.

Consumption of cigars is much affected by changes in consumer buying power. Notwithstanding the long-term downward trend in per capita consumption of cigars, a high level of income in the post-war period would doubtless result in a considerable increase in per capita consumption over the 1939 figure; it might range between 55

and 65 cigars annually, as compared with about 40 before the war. The average cigar would probably be considerably higher in price than in 1939, both because of a generally higher price level for commodities and because consumers could afford to buy cigars of better quality than before. In view of the uncertainties of consumer habits, however, only very rough estimates of the quantity or value of consumption can be made. Taking account of increase in population, consumption might be 50-65 percent greater than in 1939, or, say, 8-9 billion cigars, with a value of 250-350 million dollars. The figures for quantity and value of domestic production would not be much smaller than these.

Imports from Cuba.—The increase in the consumption of high-priced cigars during a period of high national income would probably be very great, along with that of many other luxury articles. Percentagewise, it would undoubtedly much exceed the increase in total consumption of cigars. This effect would appear with respect both to imported Cuban cigars and to the best grades made in this country from Cuban leaf, but it would presumably be relatively more conspicuous for the imported cigars, which are particularly high in price. The force of the psychological factors involved cannot be predicted with any approach to accuracy. The same is true for the effects of a change in duty on imports; presumably these effects would be about the same (in terms of percentage) with a high national income as with no change in income (see above).

Duty as in 1939.—Imports from Cuba might be 8-10 times larger than with national income as in 1939. They might amount to 25-30 million cigars, with a value in the neighborhood of 3 million dollars. Even so, if there should be virtually no imports from the Philippines, the domestic production would be but little less than the total consumption.

Duty reduced by 50 percent.—The effect might be to double the imports from Cuba, which might amount to about 50-60 million cigars, with a value in the neighborhood of 6 million dollars. Domestic production would be slightly less than with no change in the duty.

Duty increased by 50 percent.—Imports might be about one-third less than with no change in duty and might have a value of about 2 million dollars. Domestic production would account for 99 percent or more of the total value of consumption.

Exports

The exports of cigars from the United States are not important, nor is there likelihood that they will be.

Employment

It appears likely that the pre-war trend will continue for some time and that the cigar-manufacturing industry will be further mechanized. The number of workers needed might be in the neighborhood of 65,000 at the higher-income level.

TOBACCO STEMS NOT CUT, GROUND, OR PULVERIZED

Tariff paragraph: 1787.

Commodity: Tobacco stems not cut, ground, or pulverized.

Rate of duty: Free.

GENERAL

Data on United States exports and imports for 1939 are given below:

Item	Exports	Imports
Quantity (1,000 pounds).....	20,912	2,255
Value (\$1,000).....	494	1,198
Unit value (cents per pound).....	1.65	5.18

¹ Foreign value.

Tobacco stems are the midribs of tobacco leaf. About one-fourth of the weight of the total leaf used in manufacture comprises stems, but there are no data pertaining to the quantity produced.¹ The stems of most types of tobacco are used in the production of nicotine insecticides and fertilizers. The stems of the fire-cured types of tobacco are used in making snuff to give bulk and mildness of flavor to the finished product. Various quantities are also used in the production of smoking tobaccos.

Exports are normally much larger than imports. In 1939, however, total exports were nearly twice as great as in previous years. China has received the greater part, some 95 percent in 1939. Most of the remainder has gone to Germany and Sweden. The imports, supplied principally by the United Kingdom and Italy, have consisted of stems from dark fire-cured tobacco which was originally imported into these countries from the United States in the form of unstemmed leaf.

POST-WAR SHORT TERM

Domestic use of tobacco stems will change little from pre-war years. Because of shortages of tobacco in Europe and China, it is quite possible that the foreign demand for tobacco stems will be at the high 1939 level. Little change in price seems likely. Imports may also be at about the same levels as in 1939, both in quantity and value.

POST-WAR LONG TERM

Consumption, Production, and Imports

The production of tobacco stems will be determined by the quantity of leaf used in the whole tobacco industry. The bulk as in pre-war years will be used in the production of insecticides and fertilizers and relatively small quantities in manufactured tobacco products. Imports may resume their fairly constant pre-war level. Annual imports may be in the neighborhood of 3.5 million pounds. At 1939 unit prices this would represent a total foreign value of \$110,000. With a 75-

¹ The total quantity of leaf used in 1939 was 835 million pounds; the weight of the stems in this tobacco would exceed 200 million pounds.

percent increase in national income, and prices probably 10 to 15 percent above 1939, the value would probably be about \$125,000.

Exports

Exports during the later post-war years probably will not be very different from the average for the pre-war years, which was approximately 15 million pounds.

Employment

Tobacco stems are a byproduct of the tobacco industry, and no data are available regarding employment.

SCHEDULE 7. AGRICULTURAL AND FISHERY PRODUCTS, AND RELATED ITEMS PROVIDED FOR IN THE FREE LIST

INTRODUCTION AND SUMMARY

Sections for the commodities covered by schedule 7 of the Tariff Act of 1930, which come within the scope of Senate Resolution 341, are presented below. As far as practicable, closely related commodities have been treated in groups, with the result that in some reports, especially those on spices, shellfish, and byproduct feeds, duty-free imports have been included with the dutiable imports under schedule 7.

This section includes all items in schedule 7, the imports of which in 1939 were valued at \$100,000 or more, except (1) castor beans and flaxseed, which appear in the section on fats and oils under schedule 1, and (2) five groups of commodities, listed below, which do not lend themselves to the analysis called for in Senate Resolution 341. Of the last-mentioned groups, one—wheat flour—consists principally of flour imported free under bond for blending and export, the imports for consumption in the United States being valued at less than \$60,000 in 1939. The other three items are basket classifications covering a wide variety of articles and subject to a considerable number of different influences, making it impracticable to estimate probable post-war production and trade.

Commodity	Tariff paragraph	Tariff status	Value of imports, 1939
Game, except birds, n. s. p. f.....	704	Dutiable.....	1,000 dr. less 134
Wheat flour:			
Duty-free in bond for export.....		Free.....	128
Dutiable imports for consumption.....	729	Dutiable.....	57
Total, wheat flour.....			196
Other fresh vegetables.....	774	Dutiable.....	164
Vegetables prepared or preserved, n. s. p. f.....	775	do.....	682
Edible preparations for human consumption.....	1558	Free.....	408
Total.....			1, 028

The post-war estimates of production (for the domestic market) and imports of agricultural and fishery products under the several assumptions in Senate Resolution 341 have been totaled. (Wherever the estimates are given in ranges, the average of the high and low extremes has been used in making these totals.) The data available on exports and employment are not complete enough to warrant tabulation. The following tabulation summarizes these estimates and compares

them with actual production (for the domestic market) and imports in 1939:

Period, income level, and tariff treatment	Production for the domestic market		Imports	
	Million dollars	Percent of 1939	Million dollars	Percent of 1939
<i>Agricultural products, dutiable¹</i>				
1939.....	8082.6	100	135.2	100
Post-war long term:				
Per capita national income same as in 1939:				
Duty as in 1939.....	9304.2	117	143.3	106
Duty reduced by 50 percent.....	9269.2	115	308.8	151
Duty increased by 50 percent.....	9636.7	118	98.7	73
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939.....	14234.6	177	242.2	179
Duty reduced by 50 percent.....	14005.5	175	330.1	244
Duty increased by 50 percent.....	14424.0	179	176.2	130
<i>Agricultural products, free</i>				
1939.....	312.9	100	227.0	100
Post-war long term:				
Per capita national income same as in 1939.....				
Duty as in 1939.....	444.7	142	322.0	142
Per capita national income 75 percent higher than in 1939.....	599.3	192	429.0	189
<i>Fish and shellfish, mixed dutiable and free²</i>				
1939.....	180.9	100	32.4	100
Post-war long term:				
Per capita national income same as in 1939:				
Duty as in 1939.....	234.0	130	42.5	131
Duty reduced by 50 percent.....	232.0	128	47.5	147
Duty increased by 50 percent.....	237.0	131	38.5	119
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939.....	335.0	185	65.0	201
Duty reduced by 50 percent.....	320.0	177	73.0	225
Duty increased by 50 percent.....	345.0	191	58.0	179

¹ Includes a few free items treated in groups of dutiable items, principally byproduct feeds and spices.

² Since much more than half of the imports are dutiable, the two groups, fish and shellfish, are classed as dutiable in the general summary table.

Agricultural commodities.

Imports of the agricultural commodities dutiable in schedule 7, including a few groups of mixed dutiable and duty-free commodities but excluding the two items mentioned above that are covered in the reports under schedule 1, were valued at 167 million dollars in 1939. Excluding the duty-free items but including the other two items—castor beans and flaxseed—treated in the sections on schedule 1, the dutiable imports in 1939 which are covered in these sections would constitute well over 95 percent of the total agricultural imports under schedule 7.

It should be emphasized that the foregoing figures on production do not include production for export, although, as indicated in the general introduction, the sections on particular commodities discuss post-war export probabilities. It should also be emphasized that the estimates made for individual articles under the several assumptions in the resolution are subject to considerable, frequently wide, margins of error. Prices especially are uncertain. In the estimates for articles included in the table above, the errors are probably in both directions and thus may tend to offset one another. Nevertheless, the margin of error in the totals given above is doubtless considerable.

It should be noted also that the sum of the figures of production in 1939 (and also of course of the estimates) overstates the net value because of the duplication of values in certain articles at different stages of production.

In preparing the post-war estimates for the commodities in this schedule, it has been necessary to take into account the several Gov-

ernment programs with respect to both the domestic and the imported agricultural products. In general, it has been assumed that measures undertaken to meet the conditions arising out of short-term post-war adjustments will not apply in the long-term post-war period. It has been assumed, however, that other legislation and programs which are not limited to the short-term adjustment period will be in effect or will be superseded by substantially similar measures. Accordingly, the essentially short-term measures now in effect under the laws of the land, such as the maintenance of specified percentages of parity prices for two years following the termination of hostilities, are not assumed to continue in effect in the post-war long term (1953). On the other hand, legislation now in effect and not specifically limited as to duration, such as quota limitations on certain imports, is assumed to be in effect in the post-war long-term period. Although it may well be that these assumptions will not prove to be true, in order to prepare the estimates called for by Senate Resolution 341, the assumptions were necessary.

The foregoing summary tabulation indicates the probability that, in the post-war long term, the value of domestic production of dutiable agricultural products will, under any of the assumed rates of duty, exceed that of 1939 by more than the estimated 10-percent increase in population, even if per capita national income remains the same as in 1939. The same is true of duty-free articles, of which the only one of importance in domestic production is short-staple cotton. The percentage increase in quantity of production may be, on the whole, about the same as that in population. The greater increase shown in the value of production is probable, largely because of the fact that farm prices in 1939, the base year, were somewhat below the average of pre-war years. The uncertainty of prices of farm products adds to the margin of error in these estimates.

Under the higher post-war income assumption the foregoing tabulation shows a greatly increased value of production; this increase is expected to result principally from a very substantial increase in the prices of farm products, possibly as much as 40-60 percent above those in 1939. In addition to higher prices, an increased quantity of production may be expected because of the larger population, the probable increase in per capita consumption of the higher priced commodities, if not of the commodities as a whole, and the tendency toward greater wastage which prevails in periods of prosperity. These considerations appear to warrant figures in the summary which indicate a value of production under the higher income level (assuming rates of duty as in 1939) 77 percent above that in 1939.

Coffee, bananas, cocoa beans, and tea account for most of the imports of the duty-free items treated separately. The substantial increase in the estimated value of imports of this group for the low level of income in the post-war long term is attributed largely to the increase in the price of coffee, which alone made up over half of the imports in 1939. The price of raw coffee in that year was unusually low and part, at least, of the wartime rise of this price will probably be maintained after the war. The still greater value of these imports shown for the high level of income is likewise attributed principally to a further rise in prices. The principal commodity in the group of duty-free items separately treated that is produced domestically is

short-staple cotton, the price of which was also comparatively low in 1939. Accordingly, the greater value of domestic production in the post-war long term is attributed to the higher price of cotton.

Imports, both dutiable and free, like domestic production, are expected to respond sharply to changes in the level of national income. From the summary figures given above it appears that, with duties as in 1939, dutiable imports may increase relatively less than domestic production under the 1939 income level and slightly more than production under the higher income level. Imports of the higher-priced food and specialty items would probably increase but little with a low level of national income, and increase sharply with a high income level.

At each level of national income the value of imports would be affected considerably by changes of 50 percent in the rates of duty; largely because of the prevalence of specific rates, the imports would be more affected by duty changes at the lower than at the higher level of national income, since prices would rise sharply with high income.

Fishery products.

The manner in which post-war production and imports of fishery products has been estimated differs greatly from that followed for agricultural products, and for products in most of the other tariff schedules. All edible fish, whether free or dutiable, are considered as one group; and all edible shellfish and crustaceans as another group. The number of individual classes of fish in the tariff act and in the trade statistics is very large, whether distinguished according to species or method of preparation. The number of classes of shellfish is not so great but is fairly large. Possible changes in the runs of fish of different species and in the relative importance of different methods of preparing fish and shellfish for market make it impracticable to make post-war estimates of production and imports for individual items. The method of analysis followed is such that practically the entire import trade is covered, whether dutiable under schedule 7 or included in the free list.

In 1939 the total foreign value of fish imported for human consumption was 23.6 million dollars, of which 21.8 million represented dutiable fish and 1.8 million free items. The free items are fresh or frozen sea herring, smelts, and tuna. The total imports of edible shellfish were valued at 8.8 million dollars, 4.7 million being dutiable (predominantly canned crab meat) and 4.1 million free (predominantly live, frozen, and canned lobsters). It is evident from these ratios that changes in duties would be more likely to affect the imports of edible fish than those of shellfish.

In 1939 the imports of edible fishery products amounted to 32.4 million dollars, and the value of domestic production for the domestic market (which, by reason of the method of calculation employed involves no duplication) to 180.9 million, imports thus being equal to about 18 percent of such production; the percentage would be somewhat higher if duties, transportation costs, and other charges were added to the foreign value of imports.

It is estimated that, with national income the same as in 1939 and the duties unchanged, both domestic production and imports of fish would be approximately 30 percent greater, in value, in the post-

war period than in 1939. This increase would be attributable chiefly to more expensive methods of preparing fish (particularly the increased sale of fresh and frozen filleted fish), and to somewhat higher prices for round fish. It is also estimated that with national income 75 percent higher than in 1939, the value of domestic production would be somewhat more than 40 percent greater than at the lower income level, while the value of imports would increase by a considerably larger percentage, since luxury and semiluxury items constitute a larger proportion of the imports than of the domestic production.

The estimates indicate that with national income as in 1939, changes of 50 percent in the rates of duty would affect the imports of edible fishery products appreciably, but, because a large part of these imports is either duty-free or subject to comparatively low rates, the effect of such changes in duty would be much less than that resulting from the assumed changes in national income.

CATTLE AND BEEF

Tariff paragraphs: 701, 706, and 1606 (a).

Commodity: Live cattle and calves:
 Fresh, chilled, or frozen beef and veal;
 canned, pickled, and cured beef and veal;
 and canned meats, n. e. s., in terms of equivalent dressed weight.

Rates of duty: Effective July 1, 1939. *Equivalent ad valorem (1939):* (See tables 1 and 2.)

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity ¹ (million pounds).....	7,783	24.6	7,758	449	8,207	Percent 5.5
Value ² (million dollars).....	1,012	3.3	1,009	30		
Unit value (cents per pound).....	13.0	13.4	13.0	6.7		
Persons employed.....	(³)					

¹ In terms of equivalent dressed weight; production does not include the beef equivalent of imported live animals.

² Based on value as reported in Census of Meat Packing, 1939.

³ Foreign value.

⁴ At 8.8 hours of man-labor per 100 pounds of dressed weight produced, 68.5 million man-days (of 10 hours per day) or about 230,000 man-years of 300 working days of farm and ranch labor would be required for the 1939 production, and about 45 percent of the work of about 190,000 persons in the butchering, wholesale meat packing, and sausage industries, i. e., the time of approximately 81,000 full-time workers. This gives a total of 311,000 full-time workers.

TABLE 1.—*Cattle and calves: Imports, 1939*

	Calves	Light cattle	Dairy cows	Other dutiable cattle	Pure-breds for breeding	All cattle
Duty (cents per pound, live weight).....	1.5	2.5	1.5	1.5	Free	
Equivalent ad valorem (percent).....	17	80	21	27		130
Imports:						
Number (1,000 head).....	115.1	401.9	8.6	228.0	10.1	763.7
Live weight (million pounds).....	19.3	160.4	8.0	221.3		
Equivalent dressed weight ² (million pounds).....	10.2	85.0	4.2	117.3	4.6	221.3

¹ Dutiable.

² 53 percent of live weight; 450 pounds dressed weight per head for duty-free purebreds.

NOTE.—The rates fixed in the Tariff Act of 1930 on live cattle were 2½ cents per pound on those weighing less than 700 pounds each, and 3 cents per pound on those weighing 700 pounds or more each. Pursuant to the first trade agreement with Canada, effective January 1, 1936, the rates on calves up to 175 pounds and on dairy cows were reduced to 1½ cents, and the rate on heavy cattle other than dairy cows, i. e., those weighing 700 pounds or more, was reduced to 2 cents; all reduced duties were subject to tariff quotas, entries in excess of quotas remaining subject to the 1930 rates. Pursuant to the second agreement with Canada effective January 1, 1939, the 1½ cents rate was made applicable to calves weighing up to 200 pounds, and the rate on heavy cattle other than dairy cows was further reduced to 1½ cents, and the tariff quotas were increased. Pursuant to the trade agreement with Mexico, effective January 30, 1943, the rate on light cattle (200-700 pounds) was reduced to 1½ cents per pound, without quota restriction during the emergency. The tariff quotas applicable to all cattle were removed, with provision for the resumption of the tariff-quota system after the emergency.

TABLE 2.—*Beef and veal: Imports, 1939*

	Fresh, chilled, and frozen beef and veal	Canned beef, including corned	Pickled and cured beef and veal	Miscellaneous canned and prepared meats	Total fresh, canned, and prepared	Total, live animals and meats
Duty (cents per pound).....	6	16	16	16		
Equivalent ad valorem (percent).....	57	60	84	30	60	145
Imports:						
Actual weight (million pounds).....	2.5	85.9	2.2	0.1	90.7	
Equivalent dressed weight ² (million pounds).....	2.5	222.4	2.2	0.1	227.2	448.5

¹ 20 percent minimum.

² Dutiable.

³ Converted at the ratios of 1 pound of fresh or of pickled beef to 1 pound of dressed weight, 1 pound of canned to 2.59 pounds of dressed weight, and 1 pound of other items to 1.5 pounds of dressed weight. One-half of the imports of miscellaneous canned and prepared meats was assumed to consist of beef and veal.

NOTE.—The rate on fresh, chilled, and frozen beef and veal of Cuban production, 4.8 cents per pound under the 1930 Tariff Act, was reduced to 3 cents per pound, effective January 5, 1942, pursuant to agreement with Cuba. The rate on canned, pickled, cured, and other prepared or preserved meats (except certain meat pastes) was reduced from 6 to 3 cents per pound (20 percent minimum) pursuant to the trade agreement with Argentina, effective November 15, 1941. The meat pastes excepted from the Argentine agreement were those included in the United Kingdom agreement, pursuant to which the ad valorem minimum rate was reduced from 20 to 10 percent.

Per capita consumption of beef and veal in all forms in 1939, 61.9 pounds dressed-weight basis, was at approximately the pre-war average.¹ It constituted 47 percent of the per capita consumption of about 132.8 pounds of all meats in that year. Of the remaining 53 percent, 48 percent consisted of pork (exclusive of lard), 64.3 pounds, and 5 percent of lamb and mutton, 6.6 pounds.

Production of beef and veal in the United States always has been predominately from the slaughter of cattle and calves raised in this country. Published production data, however, include the meats obtained from cattle and calves imported into this country, almost entirely from Canada and Mexico, for immediate slaughter or for

¹ In the 20-year period 1920-39 the like average for beef and veal was about 62.6 pounds, and for all meats approximately 133.8 pounds per capita, the ratio of beef and veal to all meats being about 47 percent.

feeding prior to slaughter. Domestic production of beef as discussed in this report does not include the beef of imported live cattle. The volume of United States production of raw materials, i. e., principally slaughter cattle,² depends in part on general economic conditions, in part on the supply of grazing and feedstuffs in any given year, and in part on the position of that year with respect to the cattle production cycle as a whole.³ This position within the cattle cycle largely determines the number of animals available in a given year for feeding and slaughter. In years when relative prices of beef and of feedstuffs promise to be unusually favorable to beef production, however, cattle may be kept on feed longer to put on added weight and finish, or more cattle than otherwise may be put on feed to take advantage of this favorable situation. During the war years, production has been much larger than previously, but the production cycle is now passing its peak, and the supply of domestically produced beef and veal is expected to trend downward for a number of years before another increase occurs.

In 1939, approximately 90 percent of the total United States output of beef and veal was consumed in the form of fresh meats, the rest being processed into sausage, canned beef and meat specialties, and pickled or cured beef. These proportions have varied comparatively little during the past 25 years, and will probably remain substantially unchanged for a considerable period after the war is over.

Since 1921, imports of cattle and beef have been relatively large in periods of active demand and comparatively high prices in this country and small at other times. Furthermore, changes in rates of duty have affected imports of cattle. Fluctuations in the production cycle, as related to the trend of demand at a particular time, have, of course, also affected supply and prices and hence imports. For a number of years before 1928, imports were principally in the form of live cattle. Early in 1927, however, the commercial production of canned corned beef in this country practically ceased, because the supply of low-grade meat was much smaller than previously and the demand for sausage (a more profitable outlet) took nearly all the raw material formerly canned. Thereafter, aside from a limited output to fill Government orders,⁴ the United States production of canned beef consisted almost entirely of relatively high-priced beef specialties. Imports supplied practically all of the commercial consumption of the lower-priced items, entries of which became increasingly important. In 1929 and subsequently, imports of canned corned and roast beef from South America often were as important in dressed-weight equivalent as imports of live animals from Canada and Mexico.

Entries of beef and veal in fresh, chilled, or frozen forms have been small compared with domestic production since 1915, and particularly since 1927, owing partly to the sanitary embargo. Imports of pickled, cured, and other prepared forms of beef (except canned) have also been small since 1930.

² Normally the production of veal comes predominantly from the slaughter of calves disposed of from herds kept chiefly for milk production. Since milk production tends to vary quickly and directly with changes in general economic conditions and national income, the production of *veal* does the same. The slaughter of dairy cattle varies less directly because, when demand for milk slackens, many dairymen feed less grain and concentrates for a time, thus producing less milk, before they generally discard more than the usual proportion of old cows.

³ The cattle production cycle, i. e., the trend in numbers on hand January 1, averages about 15 years in length from peak to peak, compared with about 9 years for sheep and 5 years for hogs.

⁴ Before the war such orders were small except in 1924-26 when a large part of several million cattle purchased as a measure of drought relief were processed into canned beef, on Government account, for use chiefly in relief.

In 1939 the estimated dressed-weight equivalent of imports of beef and veal in all forms was 448.5 million pounds, or 5.5 percent of total consumption. Imports in the form of live cattle and calves amounted to 221.3 million pounds, dressed weight equivalent, or 2.7 percent of total beef consumption, and of canned beef (of which as stated above there is practically no production in the United States) to 222.4 million pounds, also 2.7 percent of consumption. Entries of fresh, chilled, and frozen beef and veal were 2.5 million pounds and of pickled or cured and other prepared forms about 2.3 million pounds, or less than 0.1 percent of total consumption for these items combined.

Exports of cattle and beef were relatively unimportant after 1918, and by 1939 had become extremely small. In 1939 the dressed-weight equivalent of all exports amounted to 24.6 million pounds, or less than 0.4 percent of total United States production.

Production of beef and veal from total slaughter in this country (including imported live animals) was 8,002 million pounds, and the per capita consumption was 61.9 pounds, in 1939. There was no significant change in 1940 or 1941 but these respective totals increased to 9,970 million and 74 pounds in 1942, compared with 9,678 million and 70.6 pounds in 1943. Owing to military demands, however, the civilian per capita consumption in 1943 was 59 pounds, or about 3 pounds less than in 1939. Imports in all forms increased from 448 million pounds in 1939 to 524 million pounds in 1941 but declined to 445 million pounds in 1943. Domestic exports (excluding United States military items) increased from about 25 million pounds in 1939 to nearly 137 million pounds in 1941; to 362 million in 1942, and to nearly 623 million pounds in 1943. Within a few years after the war the export trade of this country in cattle and beef will probably become small again.

In the following discussion it is assumed that the sanitary embargo, effective January 1927 (Bureau of Animal Industry Order 298) will not be modified or removed for a long period. The effect of this embargo is to prohibit imports of live animals or of fresh, chilled, or frozen beef and veal from South American countries, by far the principal source of export beef. Imports into the United States from such countries are limited to canned, pickled, and other cured beef and veal.

Another assumption made in connection with the following estimates is that the system of tariff quotas on imports of cattle and calves, which has been temporarily suspended under the trade agreement with Mexico, will be reestablished. The agreement with Mexico provides that 30 days after the end of the war the reduced rates of duty established on calves and heavy cattle by the 1939 trade agreement with Canada, and the reduced rate of duty on light cattle provided by the trade agreement with Mexico itself, shall apply only to imports of the following number of animals in any calendar year: Calves (i. e., cattle weighing less than 200 pounds each), 100,000 head; light cattle (weighing 200 to 700 pounds each), 400,000 head; heavy cattle (weighing 700 pounds or more each, except dairy cows), 225,000 head. Imports in excess of these quotas are subject to the rates of duty provided by the Tariff Act of 1930, which are bound against increase by the trade agreements with Canada and Mexico. It is assumed that these quota provisions will be in effect in the long-term post-war period, and that, if duties are reduced or increased by 50 percent, the

changes will apply both to the rates on imports within the quota limitations and those on imports in excess of the quotas.

POST-WAR SHORT TERM

Although per capita consumption of beef and veal will probably be larger than in 1939, in the short-term period after the end of the war there is reason to expect a decrease from the wartime average, by reason of the probable downward trend in domestic production already mentioned. Imports of cattle from Canada will probably be eliminated as a result of contracts recently made by the United Kingdom to purchase the export surplus of meats from British Empire countries for a number of years. Imports of canned beef will probably increase somewhat because the United Kingdom is continuing wartime contracts with South American exporting countries only on a year-to-year basis. Such contracts will probably be terminated soon after the war is over, and those countries may be expected to ship more canned beef to the United States while European and British markets for chilled and frozen beef are being restored. Moreover, several years will probably be needed for a full recovery from the severe drought which is now affecting northern Mexico,⁵ the only source, other than Canada, for imports of live cattle and calves for feeding and slaughter.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

On this income assumption, the per capita consumption will probably be about 62 pounds, the same as in 1939. Total consumption will probably increase about 10 percent by reason of growth of population, and may thus be about 9 billion pounds. It is likely to be affected relatively little by changes of 50 percent either down or up in the rates of duty.

Duties as in 1939.—Imports would probably supply about the same proportion of consumption as in 1939, 5.5 percent; they would thus be in the neighborhood of 0.5 billion pounds, with a foreign value, at about the same prices as in 1939, of perhaps 33 million dollars. Production in that case would amount to about 8.5 billion pounds, with a value, at approximately the 1939 level of 13 cents per pound, of about 1.1 billion dollars.

Duties reduced by 50 percent.—A reduction in the duty would probably increase the imports by a large percentage, but as imports would still be a relatively small proportion of consumption, the percentage decline in domestic production would be relatively small. Imports might be approximately 50 percent greater than with no change in duty, totaling about 750 million pounds, or somewhat over 8 percent of total consumption. Part of the effect of the reduction in duty on cattle and calves would probably be some advance in the foreign prices of imported items. The average unit value of imports of beef in all forms might rise to about 7.5 cents per pound (6.7 cents in 1939), in which case the foreign value of imports in all forms would be about 58 million dollars per year.

⁵ This drought has recently been less severe.

Several factors would tend to prevent the reduction in duty from having a greater effect than above estimated. Among these factors are: Physical limitations upon the increase of cattle herds in Canada and Mexico; the probable indisposition of consumers to increase greatly their purchases of canned beef; and transportation and marketing problems involved in imports of fresh, chilled, or frozen beef and veal from New Zealand and Australia, whose principal outlet has always been the United Kingdom.

On the basis of the above estimate of imports, the domestic production, with duties reduced by 50 percent, would be about 8½ billion pounds. Prices in this country would probably average somewhat lower than with no change in duty, and the value of this production might not exceed 1 billion dollars.

Duties increased by 50 percent.—Imports might be no more than half as large as with the duties as in 1939. They might amount to about 250 million pounds, or somewhat less than 3 percent of total consumption. The foreign unit value would probably be about the same as with no change in duty, or about 6½ cents per pound, in which case the foreign value of the imports would be about 16 million dollars. On this assumption as to imports, domestic production would be about 8.7 billion pounds, or 3 percent greater than with no change in the rate of duty. Because of the higher duties the unit price of the domestic product might be about 14 cents per pound, on which basis the value of production would be roughly 1.2 billion dollars.

Per capita income 75 percent higher than in 1939.

Per capita consumption would probably be about 10 percent greater than on the lower income basis, or approximately 68 pounds, so that total consumption might be around 9.9 billion pounds. Changes of 50 percent in the rates of duty would probably not greatly affect total consumption.

It is probable that the proportion of consumption furnished by imports under the three different assumptions regarding rates of duty would be approximately the same as above estimated on the basis of income as in 1939.

Duties as in 1939.—Imports would probably supply about 5.5 percent of consumption, or approximately 550 million pounds. Assuming that high national income in the United States would be accompanied by high income in other countries, the foreign unit value of these imports would probably be considerably higher than before the war, perhaps one-third higher, thus amounting to about 9 cents per pound. On this basis the total foreign value of the imports would be approximately 50 million dollars.

With imports at this level and consumption as above estimated, domestic production would approximate 9,350 million pounds. If United States prices were about one-third higher than before the war, or in the neighborhood of 18 cents per pound, the value of domestic production would approximate 1,650 million dollars.

Duties reduced by 50 percent.—The share of imports in consumption might rise to around 8 percent, in which case they probably would be about 800 million pounds. The foreign unit value might be as much as 10 cents per pound, in which case the total value of the imports would be about 80 million dollars. The domestic production on this assumption regarding imports would be approximately 9,100 million pounds,

which, at a price of about 17 cents per pound, would have a value of approximately 1,350 million dollars.

Duties increased by 50 percent.—The share of imports in consumption might fall to about 3 percent, or in the neighborhood of 300 million pounds. The unit value would presumably be about the same as with no change in duty, or perhaps 9 cents per pound, on which basis the foreign value of the imports would approximate 27 million dollars. Domestic production on this basis would be about 9.6 billion pounds, with a value, at a price of approximately 19 cents per pound, of about 1.8 billion dollars.

Exports

Domestic exports, as noted above, would doubtless be very small, averaging about 0.3 percent of United States production.

Employment

Under the foregoing assumptions as to production, 75–83.5 million man-days (250,000–280,000 man-years of 300 working days) of farm and ranch labor would be required in the long-term period to produce 9.6 million pounds of beef and veal. In addition, 89,000–99,000 full-time workers in wholesale meat packing and allied industries would be required, or a total of 339,000–379,000 full-time workers.

PORK, INCLUDING HOGS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
703	Live hogs	1¢ per lb	5.8%
	Fresh or chilled pork	1½¢ per lb	6.4%
	Frozen pork	2½¢ per lb	15.6%
	Hams, shoulders, and bacon, or other prepared or preserved pork, not cooked, boned, or canned, or made into sausage.	2¢ per lb	6.6 and 7.2%
	Other hams, shoulders, and bacon, or other pork, prepared or preserved.	3½¢ per lb	12.4 and 11.2%
	Average		12%

NOTE.—Under the Tariff Act of 1930, live hogs were dutiable at 2 cents per pound, fresh or chilled pork at 2½ cents per pound and bacon, hams, shoulders, and other preserved pork at 3½ cents per pound. The reduced duties shown above were made effective January 1, 1939, pursuant to the trade agreement with Canada.

GENERAL

Data on United States production, imports, and consumption of pork (excluding lard) for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds, dressed weight)...	8,660	1,155	8,505	751	8,556	Percent 0.6
Value (\$1,000).....	1,065,180	20,879		\$ 10,680		
Unit value (cents per pound).....	12.3	18.5		21.0		

¹ Dressed equivalent of actual trade. (See following table.)
² Foreign value.

The per capita consumption of pork in 1939, namely, 64.3 pounds, was only slightly under the 20-year average for 1920-39, which was 65.1 pounds. Over a period of 40 years the per capita consumption has been slowly declining, while the total consumption has been increasing.

Domestic production of pork varies according to the stage in the production cycle of hogs. Monthly consumption fluctuates less than monthly slaughter, because much pork is put into storage in the season of heaviest slaughter. During the 4 years 1935-38, domestic production was unusually low as a result of two serious droughts (1934 and 1936). In 1939, domestic production of pork of 8.7 billion pounds was still 200 million pounds under the average for 1931-32. Exports sharply declined during the period of short supplies. In 1934 they amounted to about 150 million pounds, but dropped to 63 million in 1937. Imports, which rose greatly from 1936 to 1938 as a result of the droughts, were in 1939 still higher than the average for pre-war years. Imports of canned ham, which were the principal import item during the drought years, continued to be imported in considerable quantity. Imports into the United States during the 4-year period, 1931-34, averaged about 3.5 million pounds (or 0.04 percent of consumption), with a foreign value of about \$855,000.

Before 1939 imports were not significant and consisted largely of a border trade with Canada. Usually they were made up of about one-third fresh pork, from Canada, and two-thirds cured pork, mainly from Canada, with some specialties of cured pork, such as canned hams and sausages, from various European countries. Imports of hogs for breeding are entered free if registered purebreds, but the trade is negligible and is not considered in this report.

A far larger number of hogs are raised and fattened in the United States than in any other country in the world. At the turn of the century domestic exports of pork and lard amounted to about 20 percent of production. Since that time, with the exception of the war periods, this ratio has gradually become smaller, until in 1930 it was under 10 percent; after the droughts of 1934 and 1936, until 1940, it ranged from 2 to 4 percent. This gradual decline took place chiefly because international trade in pork, dominated principally by the demand of the United Kingdom, increasingly emphasized a preference for lightly cured cuts from bacon-type hogs. This country has always been a producer of lard-type hogs, and although the extremely heavy hog of former years has been discarded in favor of a type that is best finished at around 200 pounds, the resulting pork is still fatter than the pork preferred by the English. No less important is the fact that pork from the Netherlands and Denmark, which is lean pork, can be economically marketed in London with the very light cure that is so desired by the English, whereas pork from the United States requires a much heavier cure or more expensive refrigeration.

The following table gives the exports and imports of live hogs and pork products in 1939:

Hogs and pork, exports and imports, 1939

Product	Value	Weight	Dressed-weight equivalent
	1,000 dollars	1,000 pounds	1,000 pounds
Exports			
Live hogs.....	15	200	198
Pork:			
Fresh or frozen.....	3,655	21,246	26,245
Hams and shoulders, cured.....	10,273	87,879	84,945
Bacon.....	1,146	10,260	12,129
Cumberland and Wiltshire.....	795	5,770	6,289
Other pork, cured.....	1,283	14,973	15,715
Canned pork.....	3,033	9,055	11,323
$\frac{1}{2}$ canned sausage.....	263	823	1,168
$\frac{1}{2}$ other canned meat.....	194	1,050	1,313
$\frac{1}{2}$ sausage ingredients.....	80	1,275	1,594
$\frac{1}{2}$ sausage, not canned.....	133	631	776
Total.....	20,870		154,955
Imports			
Live hogs.....	5	88	88
Pork:			
Fresh or chilled.....	326	1,730	2,005
Fresh frozen.....	87	545	633
Hams, shoulders, and bacon:			
Not canned, cooked, boned, or made into sausage.....	213	702	779
Other.....	9,357	24,623	44,529
Other pickled or salted:			
Not canned, cooked, boned, or made into sausage.....	10	36	45
Other.....	972	2,333	2,916
Total.....	10,690		50,964
Average value (cents per pound, dressed-weight equivalent):			
Exports, live hogs and pork.....	12.5		
Imports, live hogs and pork.....	21.0		

Farmers breed and feed hogs in accordance with the favorableness of the price relation between hogs and corn, not only of the price relation existing at a given time but also of that expected for the following year. Thus, the corn-hog price ratio is the principal factor influencing the production cycle of hogs, which is usually 3 to 5 years in length. About 65 percent of the annual pig crop comes from spring farrowings with the result that the heaviest marketings are during the 4 months, November through February. Hogs are most economically fattened for the market during the first 6 to 10 months after birth, and although premium prices are usually paid for animals weighing 180-200 pounds, the average live weight of hogs slaughtered under Federal inspection is about 225 pounds and, when the corn-hog ratio is favorable, may exceed that figure by 20 pounds or more. Hogs usually have a dressed-weight yield of about 75 percent.

POST-WAR SHORT TERM

The per capita consumption of pork, exclusive of lard, might be somewhat greater than it was in 1939. Thus, total United States consumption would be considerably more than in that year. Imports would be practically all from Canada.

POST-WAR LONG TERM

Consumption, Production, and Imports

The estimates for quantities made below are in terms of equivalent dressed weight.

Per capita income at 1939 level.

In view of the slight tendency for per capita consumption of pork to decline, total consumption is not likely to exceed that in 1939 by more than the 10-percent increase in population. If that should prove to be correct, then consumption would amount to around 9.4 billion pounds. Production for the domestic market would probably be not less than 9,375 million pounds, with a value of about 1,155 million dollars, and would not be significantly affected by changes in the quantity of imports resulting from the different assumptions as to duty. The ratio of imports to consumption would probably be about 0.3 percent, on the assumption of no change in the rates of duty.

Duty as in 1939.—Imports in this period would probably not exceed 14 million pounds, or only about 27 percent as large as imports in 1939, and might have a foreign value of about 2.9 million dollars.

Duty reduced by 50 percent.—Imports might increase 50 percent, or to perhaps 21 million pounds, with a foreign value of about 4.4 million dollars.

Duty increased by 50 percent.—Imports might decline to about 7 million pounds, with a foreign value of about 1.5 million dollars.

Per capita income 75 percent higher than in 1939.

Per capita consumption of pork would probably be higher than in 1939, perhaps about 18 percent higher, with prices about 40 percent higher than in 1939. Consumption might then amount to about 11 billion pounds. The ratio of imports to consumption would probably not exceed three-tenths of 1 percent, regardless of the assumed changes in the rate of duty. Production for the domestic market might total about 10,975 million pounds and the value almost 1.9 billion dollars.

Duty as in 1939.—Imports might be about 28 million pounds, with a foreign value of approximately 8 million dollars.

Duty decreased by 50 percent.—Imports, particularly the specialty products, might increase in volume to about 33 million pounds, with a foreign value of almost 10 million dollars.

Duty increased by 50 percent.—Imports might be about 23 million pounds, with a foreign value of almost 7 million dollars.

Exports

Exports of live hogs declined considerably after 1933; before that year they were chiefly a trade with Mexico in slaughter animals. Since 1933 exports have been mostly of breeding animals. Exports of pork, which became very small after the droughts, but have been very large during the war period, may be somewhat larger than in 1939 and may total 250–300 million pounds, with a value of perhaps 35–40 million dollars. Under the higher income level, exports of pork may be somewhat larger and may reach 350–400 million pounds, valued at about 65–75 million dollars. (For a discussion of exports of lard, see section on fats, oils, and oil-bearing materials under schedule 1.)

Employment

The number of persons employed in the meat-packing and sausage industries, as reported by the Bureau of the Census in 1939, was 131,130 persons, of which about 48 percent, or about 63,000 persons, were engaged in the production of dressed pork. This number might increase to 70,000-75,000 persons. In addition, the production of pork on farms in 1939 is estimated to have required the full-time employment of about 127,000 persons. To produce the maximum post-war estimated volume of pork might require the full-time employment on the farm, of about 165,000-170,000 persons.

MEAT EXTRACT, INCLUDING FLUID

Tariff paragraph: 705.

Commodity: Meat extract, including fluid.

Rate of duty: 15¢ per lb.

Equivalent ad valorem (1939): 30%.

NOTE.—The rate under the Tariff Act of 1930 was 15 cents per pound, which was reduced to 7½ cents per pound pursuant to the trade agreement with Argentina, effective November 16, 1941.

GENERAL

Data on United States production for export, and imports for 1939 are given below:

Item	Production for export ¹	Imports
Quantity (1,000 pounds).....	49	1,213
Value (\$1,000).....	80	469
Unit value (per pound).....	\$1.63	\$0.39

¹ Includes bouillon cubes; total production is not available.

² Foreign value.

Meat extracts are preparations used both as a tonic and for food-flavoring purposes. They are packing-house byproducts, resulting from the production of canned meats, predominantly beef, and are obtained by concentrating the water in which the meat has been boiled after the removal of fats. A true meat extract contains only ingredients of meat soluble in hot water. Bouillon cubes are composed mainly of salt flavored with dry meat extract. In recent years there have appeared on the domestic market increasing quantities of competitive preparations which are flavored with hydrolyzed vegetable protein instead of beef extract.

There are no data of domestic production. Most United States meat packers find it more profitable to make sausage out of meat that would otherwise be available for boiling and canning. The small production in this country results from a long-standing trade, largely for export to the United Kingdom, and is limited to a few small packers. Imports fluctuate considerably but have been generally larger since 1937, due perhaps to an increase in the canning of beef in several South American countries. Imports were unusually large in 1939 and the pre-war level would therefore be better represented by the 4-year average, 1936-39, which was about 765,000 pounds, with a foreign value of about \$300,000 (39.4 cents per pound).

POST-WAR SHORT TERM

In the immediate post-war period, imports of meat extract will probably be no larger than during 1939 and may decline to the average of 1936-39. Exports and domestic production will probably be at about the 1939 level.

POST-WAR LONG TERM

Consumption, Production, and Imports

Domestic production is unreported but is known to be small and will probably be smaller in the long-term post-war period than in the pre-war period. Imports, which were in unusually large volume just before the war, will also probably be smaller. Consumption will approximate imports very closely.

Per capita income at 1939 level.

Duty as in 1939.—Imports might total about 900,000 pounds, with a foreign value of about \$354,600.

Duty decreased by 50 percent.—Imports, under these conditions, might be 1 million pounds, with a foreign value of about \$394,000.

Duty increased by 50 percent.—Imports might decline slightly to about 800,000 pounds, with a foreign value of about \$315,000.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Under the higher income level and with prices about 50 percent higher than during the pre-war period, imports might total about 1.2 million pounds, with a foreign value of about \$709,000.

Duty decreased by 50 percent.—Imports might increase somewhat to about 1.3 million pounds, with a foreign value of over \$768,000.

Duty increased by 50 percent.—Under these conditions imports might decline slightly to perhaps 1.1 million pounds, with a foreign value of about \$650,000.

Exports

Exports of meat extracts decreased sharply in the decade before the war. In the post-war long-term period exports might amount to about 40,000 pounds.

Employment

There are no data on the number of persons employed in domestic production of meat extract.

EDIBLE OFFAL

Tariff paragraph: 706.

Commodity: Livers, kidneys, tongues, hearts, tripe, brains, and sweetbreads; fresh, chilled, or frozen.

Rate of duty (July 1, 1939): 3¢ per lb., but not less than 15% ad val.

Equivalent ad valorem (1939): 20%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 6 cents per pound, but not less than 20 percent ad valorem, which was reduced to the rate shown above, effective January 1, 1939, pursuant to the trade agreement with Canada.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	1 673.6	18.9	661.7	0.8	662.5	Percent 0.12
Value (million dollars).....	1 61.6	2.0	69.6	1.1		
Unit value (cents per pound).....	19.1	11.9	9.0	16.6		

¹ From Census of Wholesale Meat Packing, 1939.

² Foreign value.

Edible offal is a byproduct of meat packing, and the volume of production varies directly with the United States slaughter of meat animals, chiefly cattle and hogs. Production and consumption of edible offal amounts to about 5 pounds per capita, and to less than 4 percent of the production and consumption of beef, veal, pork, lamb, and mutton. The bulk of the consumption of offal is in the fresh form, although a substantial part is used in sausage, and a part is cured, as beef and other tongues. In 1939 about 2.5 percent of the production, consisting of beef and hog offal not required in this country, was exported, chiefly to the United Kingdom, France, Canada, the Canal Zone, and Panama.

Imports, principally from Canada, New Zealand, and Australia, were insignificant in volume, amounting to about 0.8 million pounds, or equal to about 5 percent of United States exports and approximately 0.12 percent of United States consumption. They consisted of selected, relatively high-priced grades of these specialty meats, such as top-quality calves' livers.

The 1939 relation between production, exports, and imports was an approximate pre-war normal, and is likely to be typical of the post-war period.

POST-WAR SHORT TERM

Total and per capita consumption will probably average larger than in 1939, but probably on a declining scale as the combined production of beef, pork, and other meats tends downward from wartime levels. Imports will probably be too small to have any discernible effect on United States supplies.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Under this assumption the per capita production of edible offal can vary only as total meat production varies, and may be about 10 percent larger than in 1939, with a value of about 68 million dollars. Exports will doubtless remain comparatively small, and imports, of minor importance. With the duties as in 1939, imports might be valued at \$140,000; with the duties lowered 50 percent, the value

of the imports might be as much as \$170,000, whereas if the duties were raised 50 percent, the value would probably not exceed \$140,000.

Per capita income 75 percent higher than in 1939.

Under this assumption production would probably be 20 to 25 percent larger than in 1939, with a value approximating 75 million dollars. Exports doubtless would continue to be unimportant, and imports of minor consequence. The foreign value of annual imports might be approximately \$240,000 with the duty as in 1939; about \$260,000 with a reduction of 50 percent in the duty; and about \$230,000 with a 50 percent increase in the duty.

Exports

Under both assumptions concerning income, domestic exports would probably average about 20 times larger than imports and would probably amount to 2.6-4.4 million dollars.

Employment

Employment would vary more or less directly with changes in total livestock slaughter. (see sections on cattle and beef and on pork and pork products).

BUTTER

Tariff paragraph: 709.

Commodity: Butter.

Rate of duty: 14¢ per lb.

Equivalent ad valorem (1939): 57%.

GENERAL

■ Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹			Im-ports	Apparent con-sumption	Ratio of imports to con-sumption
	Total	For export	For domestic market			
Quantity (1,000 pounds)	2,210,429	2,208	2,208,118	1,107	2,208,225	Percent
Value (\$1,000)	561,448	600	560,788	1,299		0.05
Unit value (cents per pound)	25.4	26.6	25.4	24.3		
Persons employed (number)	28,000					

¹ Includes 428,000,000 pounds of farm-made butter, but excludes 2,616,000 pounds of renovated butter.

² Foreign value.

The amount of butter produced in the United States is very much larger than that of any other manufactured dairy product; similarly, the amount of milk required in the production of butter (a little over 20 pounds per pound of butter) is more than for any other use, with the exception of that used for fluid milk and cream for city distribution. The production of farm butter, which has been declining for many years, amounted to 429 million pounds in 1939 and to about 337 million pounds in 1943. The production of creamery butter, on the other hand, has been rather steadily increasing in volume, and reached a peak in 1941, when it amounted to 1,872 million pounds. War

conditions caused a decline in production to 1,673 million pounds in 1943, and to an estimated 1,486 million pounds in 1944 (the forecast for 1945 is 1,450 million pounds).

Although more milk is used in the production of butter, both creamery and farm, than for any other manufactured dairy product, the ratio of the amount so used to the total quantity of milk produced on farms has been declining. In 1929 the percentage was 44.0; in 1939, 42; and in 1943, under war conditions, it was 34.2.

About half of the creamery butter produced is made during the 5 months April through August; about 40 percent of it is made in three States, Minnesota, Iowa, and Wisconsin. Much butter is stored during the months of heavy production and is withdrawn in winter. Normally more than 60 percent of all domestic creamery butter is made from farm-separated cream. The increased need for nonfat solids, dried whole milk, cheese, and evaporated milk during the war period made it necessary to provide inducement to farmers to abandon farm separation and to deliver whole milk to manufacturing plants. This fact, plus an unusual demand for fluid milk and cream, has resulted in a decrease of over 20 percent in production of butter, farm and creamery, during the 3 years 1942-44, in the face of an unusual demand.

The heavy demands of the military and for Lend-Lease, at a time when supplies were unusually low, caused the Government to place a heavy ration value on butter. The per capita consumption of butter had declined in World War I to about 15 pounds. During the 1920's and 1930's it generally was between 17 and 18 pounds. After 1939, when it was 17.3 pounds, it declined to 11.8 pounds in 1944; a further decline to 10.5 pounds is forecast for 1945.

The per capita consumption of margarine, the production and sale of which are affected by various provisions of Federal and State law, was less than 2 pounds before World War I, but averaged 3.4 pounds during the 3 years 1918-20. Thereafter, until World War II, it ranged from 1.6 pounds in 1932 to 3.1 pounds in 1936 and 1937. During the present shortage, consumption has increased from 2.3 pounds per capita in 1939 to 3.9 pounds in 1944; a consumption of 4.3 pounds is expected in 1945. If no major change occurs in the legislation affecting margarine, consumption of margarine after the war may remain at a somewhat higher level than before.

Except during 1935-37, when domestic supplies of butter were short, imports of butter from 1930 to 1941 have been under 2 million pounds a year; principally imports into Hawaii from New Zealand. Imports into continental United States are normally small and depend upon the relation between London and New York prices. Imports have always increased as the spread between wholesale prices in London (the principal international butter market) and New York has approached the amount of the United States import duty. This, as a rule, has occurred only during the winter and early spring, when domestic production is lowest and prices are highest, and then only in a few years. Future imports will probably come largely from New Zealand; but Denmark, the Soviet Union, and Cuba are potential sources which may supply butter under favorable market conditions.

POST-WAR SHORT TERM

It is probable that within 2 or 3 years after the war Denmark and the Netherlands will join Australasia, Canada, and Argentina in supplying the United Kingdom and continental Europe. Although there still may be unusual demands for butter throughout the world, it is improbable that exports from the United States, which developed during the war, will be maintained. Presumably there will be a somewhat higher domestic per capita consumption of butter and margarine combined than in 1939, but the increase might be very largely in margarine rather than in butter. Imports are not likely to exceed those in 1939, so that domestic consumption will very closely approximate production.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Per capita consumption of butter seems likely to be slightly lower than before the war, but by reason of increase in population, the total consumption will probably be somewhat greater; it might be 2,200-2,400 million pounds, compared with 2,208 million in 1939. If the duty should remain as in 1939, or be increased by 50 percent, imports would be so small that the domestic production would be substantially equal to the total consumption. The price of butter would probably be somewhat higher than in 1939, about the average of 1935-39, or about 29 cents per pound. — In that case, the value of the domestic production would be 640-700 million dollars. Even if the duty should be reduced by 50 percent, with a consequent marked increase in imports, domestic production would probably still be more than 99 percent of the consumption.

Duty as in 1939.—Imports might be about the same as in 1939, or 1.1 million pounds, with a foreign value at about 25 cents per pound, or about \$275,000.

Duty reduced by 50 percent.—A reduction of the duty from 14 to 7 cents per pound would probably result in imports 10-15 times greater than in 1939; they might be 10-15 million pounds, with a foreign value of 2.5-3.8 million dollars.

Duty increased by 50 percent.—Imports under this assumption would probably be negligible.

Per capita income 75 percent higher than in 1939.

Higher incomes would result in greater per capita consumption of butter. It might be from 10-15 percent larger than with no change in national income, and total consumption might thus be 2.5-2.7 billion pounds. Domestic production would be only slightly less than total consumption even if the duty should be reduced by 50 percent. It is probable that with high national income, the price of butter would increase somewhat more than would the general price level; it might be 35-45 percent higher than the pre-war average, or 40-45 cents per pound. The value of production might, therefore, be 1-1.2 billion dollars.

Under the several assumptions regarding duties, imports would probably constitute about the same proportion of consumption with

a high national income as with national income at the 1939 level. The foreign unit value of imports would probably be 25-40 percent higher than before the war, or 30-35 cents a pound. On these assumptions the imports might be approximately as follows:

- Duty as in 1939: 1.2 million pounds, with a foreign value of \$360,000-\$420,000.
- Duty reduced by 50 percent: 15-20 million pounds, with a foreign value of 4-7 million dollars:
- Duty increased by 50 percent: Probably negligible.

Exports

Exports of butter have been small, being only about double the volume of imports in 1939, and there is no reason to believe that any significant change will take place. Exports may be 2-4 million pounds and go chiefly to Central and South American countries.

Employment

The creamery butter industry, as reported by the Bureau of the Census for 1939, employed about 23,000 persons. It is improbable that the increased production here-estimated under the higher income assumption would cause an appreciable increase in employment. In addition, the production of the milk needed for the amount of butter produced in 1939 required about 128.5 million man-days of 10 hours each, equivalent to the full-time employment of 428,333 persons per year. The increased production here estimated might require 150 million man-days, or 500,000 full-time annual employees.

OLEOMARGARINE

Tariff paragraph: 709.
Commodity: Oleomargarine and other butter substitutes.
Rate of duty: 14¢ per lb. *Equivalent ad valorem (1939):* 138% (dutiable imports only).

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	300,857	264	300,593	12,511	303,104	Percent 0.8
Value (\$1,000).....	44,226	28	44,198	189		
Unit value (cents per pound).....	14.7	10.6	14.7	7.6		
Persons employed (number).....	(?)					

¹ Includes 2,502,718 pounds, valued at \$187,937, imported from the Philippine Islands free of duty. Dutiable imports were 8,408 pounds valued at \$873.
² Foreign value.
³ Estimated at 2,000-2,500 persons employed in 1939 in the making of oleomargarine and in the crushing of the seed to obtain the oil.

For tariff purposes all butter substitutes, whether called oleomargarine, margarine, butterine, or other names, are grouped together.

For many years, the most common name has been oleomargarine, owing to the formerly common use of oleo fat and oil as raw materials. The law requires each package to contain a notice referring to the contents as "oleomargarine."

The Internal Revenue Code provides a tax of 15 cents per pound on imported oleomargarine regardless of coloring, in addition to the rate of duty of 14 cents per pound, so that charges on all imported oleomargarine amount to at least 29 cents per pound. Imported oleomargarine made from specially taxed oils is subject also to an additional import-excise tax based on the oil content. This special taxation was imposed by various revenue acts beginning in 1934, and includes, among the special import-excise taxes, a processing tax of 3 cents per pound on specified oils (those chiefly used in the manufacture of oleomargarine) and an additional tax of 2 cents per pound on coconut oil made from copra other than the product of the Philippine Islands. With respect to domestically produced oleomargarine, there is a tax of one-fourth cent per pound on uncolored oleomargarine and a tax of 10 cents per pound on naturally or artificially colored oleomargarine.

The production of oleomargarine is virtually equivalent to the consumption, because very little is imported or exported. At the time of World War I, about 75 percent of the raw materials used in the manufacture of oleomargarine consisted of domestic animal fats and over 20 percent of domestic vegetable oils. Beginning in 1916, increasingly larger amounts of foreign vegetable oils were used, and in the late 1920's and early 1930's they were used to a considerably greater extent than domestic fats and oils. Beginning in 1934, however, the use of foreign vegetable oils declined, and the use of domestic vegetable oils increased, until in 1941 only a small part of the combined raw materials consisted of foreign vegetable oils. In 1943 about 50 percent of the total volume of oils and fats used for this purpose was domestic cottonseed oil and about 40 percent domestic soybean oil.¹

During World War I the consumption of oleomargarine increased because of the relative scarcity of butter. A similar situation has prevailed in World War II. During the 5 years 1912-16, the annual per capita consumption of butter averaged 17.1 pounds, and that of oleomargarine, 1.5 pounds (an average total consumption of 150 million pounds of oleomargarine). During the years 1917-20 the per capita consumption of butter fell to 15 pounds and that of oleomargarine rose to 3.2 pounds. During the 5 years 1921-25, the consumption of butter rose to 17.2 pounds per capita, while that of oleomargarine fell to 1.9 pounds. Total consumption of oleomargarine during 1935-39 averaged about 372 million pounds, or 2.9 pounds per capita, while the per capita consumption of butter averaged 17.0 pounds. Between 1912-16 and 1935-39 the combined per capita consumption increased 1.3 pounds, representing the increased use of oleomargarine. Since the beginning of World War II the per capita consumption of butter has fallen much lower than in World War I,

¹ For report on raw materials used see report on "Fats, Oils, and Oil-bearing Materials."

whereas the per capita consumption of oleomargarine has risen somewhat higher than it did then.

Average annual imports in 1937-39 amounted to about 2.5 million pounds, with a foreign value of about \$212,000. Total imports were unusually large in 1939 for several reasons: (1) practically all were from the Philippine Islands, and into Puerto Rico, (2) imports from the Philippine Islands are not subject to either the 15-cent tax or the 14-cent duty, and (3) entries into Puerto Rico from the Philippines are not subject to the 3-cent tax on the coconut oil content of the oleomargarine which would have had to be paid if the oleomargarine had entered continental United States.³

POST-WAR SHORT TERM

In the immediate post-war period the consumption of oleomargarine will probably continue to be considerably larger than in the pre-war years. Imports will probably be negligible, and domestic production will closely approximate consumption.

POST-WAR LONG TERM

Consumption, Production, and Imports

If both the duty and the special tax on imports were reduced by half, dutiable imports would probably continue to be negligible. If the existing preferences accorded the Philippines were continued, imports from that source into Puerto Rico might total 2.5 million pounds, valued at \$190,000 annually at the 1939 income level and 4 million pounds valued at \$400,000 at an income level 75 percent higher than in 1939. Under the present law, however, preferences will cease on July 4, 1946, and in that case it is unlikely that there will be imports from the Philippines, even under reduced duties.

With the per capita national income the same as in 1939, and if no major change occurs in the domestic legislation, either Federal or State, affecting oleomargarine, domestic production and consumption might reach to 550-600 million pounds and, if valued at 16.2 cents per pound, or 10 percent higher than in 1939, might amount to 90-97 million dollars. Under the higher income level, domestic production and consumption will probably not change materially, but the value might be somewhat higher, amounting to 99-107 million dollars.

Exports

Exports are negligible and are not expected to increase significantly.

Employment

It is improbable that more than 3,000 persons will be employed in the post-war period in producing oleomargarine and in crushing cottonseed and soybeans to obtain the necessary oil.

³ See Sections 2206, 2403, and 3707(a)(9) of the Internal Revenue Code.

SWISS CHEESE

Tariff paragraph: 710.

Commodity: Swiss or Emmenthaler
and Gruyère-process
cheeses.Rate of duty: 5¢ per lb. but not less than 20% ad val.
Equivalent ad valorem (1939): 21%.

NOTE.—The rate of duty fixed in the Tariff Act of 1930 was 7 cents per pound but not less than 25 percent ad valorem. The minimum ad valorem rate was reduced to 20 percent, effective February 15, 1933, pursuant to the trade agreement with Switzerland. The present rate of 5 cents per pound but not less than 20 percent ad valorem has been in effect since November 2, 1936, pursuant to the trade agreement with Finland.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export			
Quantity (1,000 pounds).....	42,631	(¹)	14,141	56,772	Percent 25
Value (\$1,000).....	7,546		\$ 3,540		
Unit value (cents per pound).....	17.7		\$ 25.0		
Persons employed.....	(²)				

¹ Negligible.² Foreign value.

³ Probably 300 to 500 of the 6,000 persons reported by the Bureau of the Census as employed in the cheese-manufacturing industry, which does not include any part of the man-hours spent on farms in the production of milk.

The production of Swiss cheese in the United States is largely confined to communities of Swiss immigrants or their descendants, and is centered in lower Wisconsin, and to a lesser extent in Illinois and Ohio. It constituted, in 1939, 6 percent of the total production of all varieties. The milk used in the production of Swiss cheese amounts to somewhat less than 1 percent of the total output of milk.

It is the general practice in this country for assemblers or processors of domestic cheese to buy the cheese "green" from the producer and age it according to their requirements. The processing branch of the industry maintains large stocks of fully aged domestic Swiss cheese for blending purposes, and utilizes for processing most of the cheese which develops imperfections during the aging period. Thus a large but unknown volume of domestic Swiss cheese is ground for processing, although much is consumed in the natural condition.

The per capita consumption of Swiss cheese amounted to about 0.33 pound in 1932 and to 0.42 pound in 1940; it is expected that gradual increases will continue in the future.

There is no domestic production of Gruyère or Gruyère-process cheese. Imports bearing the name Gruyère consist of processed cheese in 8-ounce packages. Imports of Swiss and Gruyère-process cheese before the war came principally from Switzerland, although at times significant quantities came from Denmark and Finland. About 30 percent of total exports of cheese from Switzerland came to the United States in the pre-war period.

Before the war the wholesale price of the top grade of domestic-made Swiss cheese in New York usually ranged from 10 to 20 cents per

pound below that of the imported article; that of Gruyère-process cheese frequently was nearly twice that of the domestic Swiss. The imported cheese of both types had a restricted outlet which was largely limited to the higher income groups. With marked improvement in the quality of the domestic Swiss the ratio of the consumption of the imported to that of the domestic cheese was declining. In 1939 about 25 percent of United States consumption was imported and after the war this ratio may become smaller. The average price of Swiss cheese at Monroe, Wis., for 1939 was 17.7 cents per pound. This 1939 price was unusually low. The average for 1936-39 was 19 cents per pound and the estimates of post-war values have been based on that figure.

POST-WAR SHORT TERM

There may be a small increase in the per capita consumption of Swiss cheese, and domestic wholesale prices may be about 60 percent higher than the price during the pre-war period. There will undoubtedly be a heavy European demand for Swiss cheese in this period and imports are not likely to exceed materially the 1939 level.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

It seems likely that the per capita consumption of Swiss cheese will increase and that, with increase in population, consumption may be about 75 million pounds, or about 30 percent more than that of 1939. Changes in rates of duty may affect consumption somewhat but hardly enough to justify separate consumption estimates.

Duty as in 1939.—Imports of Swiss cheese will probably increase less than total consumption because of the general trend toward replacement of imports by domestic Swiss. They may be about 15 million pounds, with a foreign value of about 4 million dollars. Imports would then amount to about 20 percent of United States consumption. Domestic production would probably be about 60 million pounds, at prices about equal to the pre-war average of 19.0 cents, and would be valued at a little more than 11 million dollars.

Duty reduced by 50 percent.—At the lower rate of duty (equivalent to about 10 percent) imports might increase to perhaps 20 million pounds, or about one-third more than with the duty as in 1939. Imports under these circumstances would tend to have a somewhat higher unit value than with no change in the duty, and might have a total foreign value of 6 million dollars. Imports would then amount to about 27 percent of total United States consumption. Under these conditions domestic production might amount to about 55 million pounds and be valued at around 10 million dollars.

Duty increased by 50 percent.—It seems likely that a duty equivalent to some 30 percent ad valorem would materially restrict imports, which might then amount to about 10 million pounds, or one-third less than with no change in duty. The increased duty might have a tendency to depress the foreign price, so that the value of imports might amount to about 2.5 million dollars. Imports would amount to about 13 percent of United States consumption. Domestic

production would then probably amount to about 65 million pounds and be valued at about 13 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of Swiss cheese would probably increase and might amount to about 85 million pounds, or about one-eighth more than with no change in the per capita national income. Prices might be about 50 percent higher than in 1936-39. The increase in income would probably increase the share of consumption supplied by imported cheese, which many consider a luxury.

Duty as in 1939.—Imports might be, say, 20 million pounds, or about one-third greater than with no change in the national income, and have a foreign value of around 8 million dollars. This volume of imports would amount to about 23 percent of consumption. Domestic production would then be about 65 million pounds, valued, at a price of 30 cents per pound, at about 19 million dollars.

Duty reduced by 50 percent.—Imports might reach 25 million pounds and the foreign value, somewhat more than 10 million dollars. Imports would then be about 30 percent of United States consumption. Domestic production under these conditions would be about 60 million pounds, valued at about 16.5 million dollars.

Duty increased by 50 percent.—Imports would perhaps be about 15 million pounds, and would be a little lower in unit value than with an unchanged duty; the total value might amount to about 5.5 million dollars. This volume of imports would constitute about 17 percent of United States consumption. In this event domestic production would probably be about 70 million pounds and would be valued at nearly 21 million dollars.

Exports

There are no statistics of exports, if any, of Swiss or Gruyère-process cheese. Exports are not likely to be of importance in the post-war term.

Employment

The cheese industry, as reported by the Bureau of the Census in 1939, employed 6,000 persons, and perhaps 300 to 500 of these may have been employed in making Swiss cheese. Under the maximum assumed levels of production enumerated above the number of persons so employed might range between 500 and 700. In addition, the production of the milk used in making Swiss cheese represented in 1939 around 1,250,000 man-days of 10 hours each, which would be the equivalent of about 4,184 men fully employed. The production during the higher income level, as estimated here might require 6,862 persons at full-time employment for 1 year to produce the required milk.

CHEDDAR CHEESE

Tariff paragraph: 710.

Commodity: Cheddar (American) cheese.

Rates of duty: 4¢ per lb., but not less than 25% ad val. *Equivalent ad valorem (1939):* 29%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 7 cents per pound, but not less than 25% ad valorem. The rate on cheddar in original loaves was reduced to 5 cents per pound but not less than 25% ad valorem, effective January 1, 1936, pursuant to the first trade agreement with Canada. The rate on all cheddar, not further processed than by division into pieces, was reduced to 4 cents per pound but not less than 25% ad valorem, effective January 1, 1939, pursuant to the second Canadian agreement.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Items	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	541,545	308	541,049	6,233	547,284	Percent 1.2
Value (\$1,000).....	72,888	108	72,780	1,906		
Unit value (cents per pound).....	13.3	31.8		14.3		
Persons employed (number).....	3,000					

¹ Foreign value.

² Persons employed in making all cheese, Census of 1939.

Cheddar or American cheese represents 70 to 75 percent of total production of all types of cheese made in this country. In 1932 the production of cheddar was about 374 million pounds and exports were about 1.5 million pounds; in 1942, with exports of 305 million pounds, production had increased to about 921 million pounds. The production of this type of cheese in 1939 used about 5 percent of the total amount of milk produced; during the war this percentage has increased. Cheddar cheese is cured (stored) from 1 to 9 months, depending on the use intended.

Cheddar cheese is the principal variety used in the production of spreads, blends, and processed cheese. According to law, "processed cheese" is processed cheddar cheese, and if blended with one or more other varieties the label must name the varieties. Cheese spreads may contain, in addition to cheese, added fat, added milk solids not fat, whey, flavoring, and condiments, all of which must be stated on the label. The increasing popularity of these cheese products in the decade before World War II contributed to the sharply increased per capita consumption of cheddar cheese. In the decade 1932-41, per capita consumption of cheddar cheese rose from 3.0 to 4.4 pounds, or by almost 50 percent, and per capita consumption of all cheese increased about 37 percent during the same period.

It seems likely that the per capita consumption of cheese products, particularly cheddar-cheese products, will continue to increase after the war. The industry plans to merchandise small consumer packages of cured cheddar cheese in the natural condition, i. e., not processed, as soon as adequate supplies again become available.

Imports of cheddar cheese consist chiefly of so-called off-grades of aged cheese purchased in Canada, and are used for processing in the United States.

POST-WAR SHORT TERM

If cheese is no longer rationed and the supply of cheddar cheese, both in natural condition and processed form is adequate, it may be expected that the consumption in the United States will be considerably greater than it was before the war. Allowing also for the increase in population, it may be 40 to 50 percent more than in 1939, or to 750 to 850 million pounds annually. In 1943 the wholesale selling price of cheddar cheese was controlled but was 111 percent

greater than that which prevailed in 1939. In the immediate post-war period it seems improbable that prices will be that much higher than in 1939 but they may be as much as 50 percent higher than the 1935-39 average of about 14 cents per pound. At this high level of consumption there would likely be a greater demand for cheese from Canada and imports might increase to 40-50 percent above the 1939 level, in which case they would total 9.0-9.5 million pounds, with a foreign value of 1.9-2 million dollars.

POST-WAR LONG TERM

Consumption, Production, and Imports

It is improbable that the amount of cheddar cheese consumed would be influenced materially by changes in the volume of imports. As was true before the war, domestic production may be expected to supply virtually all of consumption and be affected only slightly by changes in imports resulting from different rates of duty.

Per capita income at 1939 level.

Duty as in 1939.—It seems likely that the basic trend of the per capita consumption of cheddar cheese will continue upward after the war and that, under the conditions assumed, total consumption and production (nearly all of which would be for the domestic market), taking account of the increased population, will be 900-1,000 million pounds, or from 70 to 80 percent more than that in 1939. The price of cheddar cheese would be somewhat higher than in 1939, about the average of 1935-39, or about 14 cents per pound. In that case the value of domestic production and consumption would be somewhere between 126 and 140 million dollars. It appears probable that consumption would be supplied by domestic production and imports in substantially the same ratios as prevailed in 1939; in this event, imports may be about 10.5-11.5 million pounds, with a foreign value of between 1.5-1.6 million dollars.

Duty reduced by 50 percent.—A 50-percent reduction in duty might be expected to increase materially the volume of imports, possibly to as much as 2½ to 3 times the volume imported in 1939, or to 16-20 million pounds, with a foreign value of 2.3-2.8 million dollars. This would constitute from 1½-2 percent of the consumption. Production would be only slightly less, percentagewise, than at the 1939 rate of duty.

Duty increased by 50 percent.—An increase of 50 percent in the rates of duty would probably reduce imports to much less than 1 percent of consumption and they might be less than 2 million pounds, with a foreign value of less than \$300,000.

Per capita income 75 percent higher than in 1939.

Since the consumption of cheese is appreciably affected by changes in per capita income, it would appear that consumption of cheddar cheese would probably be 15-25 percent higher than with no change in national income, and might total 1,050-1,250 million pounds annually. Prices under these conditions would probably be 40-50 percent higher than the average during 1935-39, or 20-21 cents per pound, and the value of consumption, therefore, might be 210-260 million dollars. Domestic production would continue to approximate total consumption, and to be nearly all for the domestic market.

Duty as in 1939.—Assuming imports to supply about the same proportion of total consumption as in 1939, they would total 14–15 million pounds with a foreign value, at prices 40–50 percent higher than in 1939, of 2.8–3.2 million dollars.

Duty reduced by 50 percent.—Imports would probably be substantially larger. Notwithstanding the relatively limited quantity of cheddar cheese that may be available in Canada (where the production in recent years has ranged between 125 million and 150 million pounds, or less than 10 percent of that in the United States), imports might increase to a level about four times as great as in 1939, or to 22–26 million pounds, with a foreign value of, perhaps, 4.4–5.5 million dollars. This quantity would be 2 percent or less of domestic consumption.

Duty increased 50 percent.—A 50-percent increase in duty probably would reduce imports to below 1 percent of United States consumption; they would probably not exceed 2 million pounds, with a foreign value of about \$400,000.

Exports

Export possibilities for natural cheddar cheese are somewhat limited, but exports after the war may increase somewhat, particularly of blends, spreads, and processed cheese. In 1939 exports of the latter were about twice the volume of exports of natural cheddar. The cheese content of these products is not known, but the aggregate amount involved could not have been large. No account of it was taken in the foregoing discussions.

Employment

The cheese industry, as reported by the Bureau of the Census for 1939, employs about 6,000 persons. About three-fourths of these, or about 4,500, may be employed in making cheddar cheese. At the consumption levels indicated above for the post-war long-term period, employment in the cheddar cheese industry may increase to between 6,000 and 8,000 persons.

In addition the production of milk needed for the amount of cheddar cheese produced in 1939 required the equivalent of the work of about 53,000 persons at full-time employment for a year. The maximum production here estimated might require about 69,000 persons at full time for a year.

CHEESE, OTHER THAN CHEDDAR, SWISS, AND GRUYÈRE

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
710.....	Romano or Pecorino, Reggiano or Parmesano, Provoloni and Provolette, and "other" cheese, n. s. p. f.	7¢. per lb., but not less than 35% ad val.	35%
	Roquefort, Blue-mold, and Edam and Gouda.	5¢. per lb., but not less than 25% ad val.	

NOTE.—The rate fixed in the Tariff Act of 1930 on all these cheeses was 7 cents per pound, but not less than 35 percent ad valorem. The rate was reduced to 5 cents per pound, but not less than 25 percent ad valorem, on Roquefort and Blue-mold, effective June 15, 1936, pursuant to the trade agreement with France, and on Edam and Gouda, effective February 1, 1936, pursuant to the agreement with the Netherlands. The same reduced rate was made effective November 15, 1941, on Romano, Pecorino, Reggiano, Parmesano, Provoloni, Sbrinz, and Goya, pursuant to the trade agreement with Argentina, with reservation to the United States of the right to withdraw or modify the reduction after termination of the war with Germany.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds).....	194,351	38,875	162,920	Percent ²⁴
Value (\$1,000).....	20,304	\$ 8,308		
Unit value (cents per pound).....	16.4	21.8		
Persons employed.....	(1)			

¹ Exports are negligible.

² Foreign value.

³ Perhaps 1,000 to 1,200 employed in the manufacture of cheese other than cheddar and Swiss. This does not include persons engaged in the production of milk.

The domestic production of varieties of cheese, other than cheddar or Swiss, consists, in the order of importance, of cream and Neufchatel, brick and Munster, the Italian varieties, and Limburger. In 1939 varieties other than Swiss and cheddar amounted to about 18 percent of total production of all cheese. In addition, several million pounds of other varieties not separately reported are being produced annually. Consumption of these different varieties is, of course, limited, and for all of them, amounts to about 1½ pounds per capita. There has been a gradual upward trend in the per capita consumption of most varieties, particularly the Italian varieties, blue-mold, and cream cheese. Although wartime conditions have somewhat limited consumption, production, and imports, the upward trend in consumption will probably be resumed after reestablishment of peace conditions. Domestic production cannot compete with certain foreign-produced varieties because of the absence of an adequate volume of sheep's or goat's milk.

Imports under this group consist chiefly of the Italian varieties—principally Pecorino Romano from Italy—and of Roquefort from France; in addition lesser quantities of blue-mold come from Denmark and of Edam and Gouda from the Netherlands. The Pecorino cheeses and Roquefort are made from sheep's milk, and in 1939 amounted to about 50 percent of total imports for this group. During World War II imports have been largely from Argentina. After the war it is probable that Roquefort and the Italian Pecorinos will again be the principal imports.

Domestic prices of cheese in 1939 were about 10 percent lower than the average for 1936-39 which may be considered a period representative of pre-war years.

POST-WAR SHORT TERM

It seems probable that the per capita consumption of the cheeses in this group will be slightly greater in this period than in 1939. Total United States consumption will also reflect the increase in population. Domestic wholesale prices may be around 60 percent higher than the pre-war average. Imports from Italy, France, Denmark, and the Netherlands will probably increase. It is improbable, however, that total imports will be as large as in 1939. Domestic production, therefore, will likely be substantially larger than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

It appears likely that United States consumption of these cheeses will continue to increase and that the per capita consumption will be about 20 percent greater than in 1939. This will be largely the result of increases in the consumption of the Italian varieties, of blue-mold, and of cream cheese. Allowing for increased population total consumption might amount to about 215 million pounds, or about one-third more than in 1939; it might vary somewhat with the rate of duty but not enough to warrant separate estimates. It is probable that the ratio of imports to consumption will be somewhat smaller than in 1939. Prices might be about the same as the estimated average in 1936-39, that is, about 10 percent over 1939.

Duty as in 1939.—Imports may be about 45 million pounds, or about 15 percent more than in 1939, with a foreign value of about 11 million dollars. The ratio of imports to United States consumption would then amount to about 21 percent. Domestic production might total about 170 million pounds, valued at about 31 million dollars.

Duty reduced by 50 percent.—This reduction would presumably result in a large increase in imports, which might then reach about 65 million pounds, or about 45 percent more than with the duty as in 1939. Under the circumstances the foreign unit value might be relatively higher and the value of imports might amount to 16 million dollars. Imports would thus be about 30 percent of United States consumption. In this event domestic production would perhaps total about 155 million pounds, valued at about 26 million dollars.

Duty increased by 50 percent.—Imports might fall to about 25 million pounds, or about 45 percent less than with the duty as in 1939. The reduced imports would perhaps have a slightly lower unit value and total foreign value might amount to nearly 6 million dollars. Imports would then amount to about 12 percent of United States consumption. Domestic production might be about 185 million pounds, valued at about 35 million dollars.

Per capita income 15 percent higher than in 1939.

Consumption of the several varieties of cheese constituting this group might reach about 255 million pounds, or nearly 20 percent more than with no change in the national income; the quantity consumed would be somewhat affected by the rate of duty, but not sufficiently to warrant separate estimates. Prices might be about 65 percent higher than in 1939.

Duty as in 1939.—Imports might be expected to total about 60 million pounds, or about 35 percent more than with no change in national income, with a foreign value of about 22 million dollars. Imports would amount to about 23 percent of United States consumption. Domestic production might then total about 195 million pounds, valued at about 53 million dollars.

Duty reduced by 50 percent.—With a reduced duty imports might rise to about 80 million pounds, or about 25 percent more than with no change in national income, with a foreign value of perhaps 30 million dollars. They would then amount to about 30 percent of

United States consumption. With the increased imports domestic production would decline somewhat to about 180 million pounds, valued at about 47 million dollars.

Duty increased by 50 percent.—Imports might be 40 million pounds, or only slightly above 1939. The foreign value of imports would be about 14 million dollars. This volume of imports, however, would be about 60 percent greater than under the assumed duty condition with no change in the national income. Imports under these conditions would amount to about 15 percent of United States consumption. In this event domestic production might be expected to amount to about 210 million pounds. Owing to the decline in imports, the unit value of production might be expected to be slightly higher and total value to approach, perhaps, 59 million dollars.

Exports

There are no statistics of exports, if any, of the varieties of cheeses included in this group, but exports have been of no significance and are not likely to become important after the war.

Employment

Of the 6,000 persons reported employed in the cheese industry in 1939, by the Bureau of the Census, perhaps 1,000 to 1,200 are employed in the production of cheese other than cheddar and Swiss. At the higher production levels indicated above the number of persons so employed might amount to from 1,500 to 2,000. In addition, it is estimated that 3.6 million man-days, of 10 hours each, or the equivalent of 12,000 workers at full-time employment, were required to produce the milk used in the production of these cheeses in 1939. The production of milk needed to produce the larger volume of cheese estimated here under the assumption of a high national income would require about 5.6 million man-days, or about 18,700 workers at full time.

SONGBIRDS

Tariff paragraph: 711.

Commodity: Songbirds.

Rates of duty: Valued at \$5 or less each, *Equivalent ad valorem (1939):* 32%.
50¢ each; valued at
more than \$5 each,
20% ad val.

GENERAL

Data on United States imports for 1939 are given below:

Quantity (1,000 birds)	148
Value (\$1,000)	209
Unit value (per bird)	\$1.41

¹ Includes duty-free entries from the Philippine Islands and Cuba.

² Foreign value.

There is a large production of songbirds (canaries) in the United States, but it is largely a household industry, widely scattered, largely in the hands of aged or infirm persons, and no statistics are available concerning quantity or value of output. Exports, if any, are believed to be unimportant. Imports normally include high-priced specialty birds, such as so-called rollers entered from Germany and the United Kingdom, but consist principally of less valuable birds from a number

of countries, including the Netherlands (the most important in 1939) and the Philippines. Imports in 1939 were approximately normal for the pre-war period, and almost 99 percent consisted of birds valued at \$5 or less, each. Imports have practically disappeared during the war years.

POST-WAR SHORT TERM

Because of the large number of persons greatly incapacitated as a result of the war, production in the United States is likely to increase considerably while the productive capacity of exporting countries is being restored. Imports are likely to be considerably less than in 1939.

POST-WAR LONG TERM

Per capita income at 1939 level.

Domestic production would probably increase somewhat, with imports amounting to about 160,000 birds, with a value of about \$230,000, if the duties are not changed. If the duties were lowered by 50 percent, imports might be in the neighborhood of 240,000 birds, with a foreign value of about \$400,000. If the duties were raised by 50 percent, imports might be reduced to 125,000 birds, with a foreign value of about \$150,000.

Per capita income 75 percent higher than in 1939.

Domestic production might be 10 percent higher than at the lower income level, with imports in the neighborhood of about 175,000 birds, valued at about \$255,000, if the duties were not changed. If the duties were lowered by 50 percent, imports might amount to 265,000 birds, with a foreign value of \$440,000 compared with 130,000 birds with a foreign value of about \$165,000 if the duties were raised by 50 percent.

POULTRY, LIVE (OTHER THAN TURKEYS)

Tariff paragraph: 711.

Commodity: Poultry, live—chickens, ducks, geese, and guineas.

Rates of duty: 4¢ per lb.

Equivalent ad valorem (1939): 26%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 8-cents per pound. The reduced rate of 4 cents per pound has been in effect since January 1, 1936, pursuant to trade agreements with Canada.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	2,366	0.2	2,366	0.7	2,367	Percent
Value (million dollars).....	338	0.1	338	10.1		0.08
Unit value (cents per pound).....	14.3	45.0	14.3	15.4		
Persons employed.....	(¹)					

¹ Foreign value.

² About 17.2 million man-days of 10 hours, based on 7.3 hours of farm labor per 100 pounds of poultry, or 57,333 man-years of 300 working days.

More than 95 percent of the production of poultry, exclusive of turkeys, consists of chickens. Most of the chickens are raised in flocks of less than 400 on general farms located principally west of the Alleghenies and east of the Rocky Mountains, and this central region accounts for the bulk of the sales. Exports are unimportant, amounting to 164,000 pounds, or less than 0.01 percent of the total production of 2.4 billion pounds in 1939. Exports consist principally of fowls for breeding and go chiefly to Canada.

Imports in 1935, when the duty was 8 cents per pound, were about 41,000 pounds. Following the reduction in duty to 4 cents per pound in the trade agreement with Canada, effective January 1, 1936, imports increased to 1.2 million pounds in 1936 and 4.8 million pounds in 1937. In the next 3 years (1938-40) they averaged about 1.1 million pounds, or about 0.05 percent of 1939 production. This average, rather than the much smaller entries in 1939, was probably more representative of the pre-war period. In 1938-40 about 55 percent of the imports came from Canada to markets east of Chicago, and nearly all the rest entered Puerto Rico from the Dominican Republic. Because of the unimportance of the poultry industry in other countries adjacent to the United States, Canada and the Dominican Republic will doubtless continue to be by far the most important sources of imports. During the war the production and consumption of poultry, other than turkeys, has increased sharply. Stimulated in part by larger consumer income and in part by the rationing of meat, per capita consumption increased from about 18 pounds in 1939 to approximately 25 pounds in 1943. Imports nearly doubled, but domestic production contributed nearly all of the increased supply.

POST-WAR SHORT TERM

In this period production, consumption, and imports will probably decline substantially from the high wartime level. Imports may approximate 1 million pounds annually.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income as in 1939.

Consumption and production would probably be approximately 10 percent higher than in 1939. Production for the domestic market might be about 2.6 billion pounds and, with a slightly higher unit value, might approximate 465 million dollars.

Imports may be expected to continue to supply only a negligible part of total consumption whether the duty remains at the 1939 figure or is decreased or increased by 50 percent, although the imports themselves may vary considerably with changes in the duty. With no change in duty, imports would probably average about 10 percent larger than in 1938-40, in both quantity and value, and amount to about 1.2 million pounds, with a foreign value of about \$110,000. If the duty were lowered by 50 percent, imports would probably be about twice as large as in 1938-40, i. e., average about 2.2 million pounds per year, with a foreign value of approximately \$350,000. Should duties be raised by 50 percent, imports may be no more than half as large as in 1938-40, or 0.6 million pounds, with a value of about \$75,000.

Per capita income 75 percent higher than in 1939.

In response to the stimulus of an increased demand resulting from higher income, per capita consumption may be expected to be about 25 percent larger than in 1939, or approximately 22 pounds. On this basis, total consumption would approximate 3.2 billion pounds. Domestic production would be expected to supply virtually the entire amount consumed. With prices, which it is estimated may be around 40 percent higher than in 1939, the value of production for the domestic market would approximate 740 million dollars. United States exports would probably continue to be insignificant in this period.

With no change in the rate of duty, imports may be expected to be about 20 percent larger than in 1938-40, or about 1.3 million pounds. At the higher prices likely to prevail under these conditions, imports may have a foreign value of \$280,000. If the duty were reduced 50 percent, imports might amount to 3.3 million pounds, with a foreign value of close to \$750,000, whereas, with a 50-percent increase in duty, imports might be 1 million pounds, valued at about \$200,000.

Exports

Exports throughout the post-war period will probably be insignificant in quantity and value when compared with production.

Employment

Compared with about 17.2 million man-days (of 10 hours each) required in 1939, from 18.9 million to 23.2 million man-days would be needed for domestic production of live poultry (other than turkeys), depending on the respective levels of income and production, in the long-term post-war period.

BIRDS, PREPARED OR PRESERVED

Tariff paragraph: 712.

Commodity: Birds, including poultry, prepared or preserved.

Rate of duty: 10¢ per lb.

Equivalent ad valorem (1939): 23%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	6,800	(¹)	6,800	724	7,524	Percent
Value (\$1,000).....		(²)		318		10
Unit value (cents per pound).....		(³)		43		

¹ Estimated.

² Not separately reported, but known to be small.

³ Foreign value.

The United States pre-war production consisted of boned, cooked chicken meat, canned as such, for a high-priced specialty trade. About an equal volume of the meats was used in canned chicken products such as soups, broths, and chicken a la king. The dressed weight of chickens which were canned in 1939, i. e., about 27 million pounds, amounted to little more than 1 percent of total dressed production of chickens, ducks, geese, and guineas in this country, about 2.2 billion pounds.

Imports in 1939 were about 40 percent above the 3-year average of 521,000 pounds in 1938-40, the latter volume being an approximate pre-war normal. Of this normal volume approximately 50 percent consisted of Oriental specialties imported from China for use by Chinese living in this country, and not directly competitive with domestic production. About 10 percent consisted of high-priced specialties, largely goose liver products, entered principally from France, and also not directly competitive with domestic production. The rest of the imports (about 40 percent of the total) came principally from Poland and Danzig and could be considered directly competitive with the United States output of canned chicken. Competitive imports were thus about 5 percent of domestic production; they were equivalent to a much smaller percent (about one-half of 1 percent) of the total domestic production of dressed poultry, other than turkeys.

Domestic exports are not separately reported, but are known to have been unimportant before the war. After the war they will probably remain small for a long period to come.

During the war imports have been very small but the domestic production of canned chicken has been greatly expanded to meet the requirements of the armed forces and for Lend-Lease purposes. In 1945 a total of about 70 million pounds of canned chicken and turkey, almost entirely for the armed forces, is hoped for.

POST-WAR SHORT TERM

In the period just after the war domestic production may decline quickly to substantially the pre-war volume, and imports may increase to the pre-war level provided that production facilities are restored in western Europe and in China.

POST-WAR LONG TERM

Consumption and Imports

Per capita income at 1939 level.

With no change in income, but a 10-percent increase in population, total annual domestic consumption of these items may be expected to increase to about 8 million pounds, depending partly on the assumed rate of duty, compared with 7.5 million pounds in 1938-40. With no change in the duties, imports would probably also increase about 10 percent above the 1938-40 average, or to 575,000 pounds, with a foreign value of about 265,000 dollars. If the duty were lowered by 50 percent, imports might be as large as 775,000 pounds, with a foreign value of 380,000 dollars; if the duty were raised by 50 percent, imports might be 350,000 pounds, with a foreign value of \$150,000.

Per capita income 75 percent higher than in 1939.

The per capita United States consumption of these items would probably be about 10 percent larger than otherwise, making a total annual consumption of about 8.8 million pounds, depending partly on the assumed rate of duty, compared with about 7.5 million pounds in 1938-40. Domestic exports would doubtless continue to be insignificant. With no change in the duty, total imports would probably average close to 20 percent larger than in 1938-40, and amount to approximately 625,000 pounds, with a foreign value of about \$375,000. If the duty were lowered 50 percent, imports might amount to 890,000 pounds per year, with a foreign value of approximately \$540,000, compared with about 410,000 pounds and a value of about \$225,000 if the duty were raised by 50 percent.

Exports

Exports throughout the long-term period would probably be unimportant.

Employment

No data are available.

DRIED EGG PRODUCTS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
713.....	Dried whole eggs, dried egg yolks, and albumen (dried egg whites):		
	Whole eggs.....	27¢ per lb.....	73%
	Albumen.....	do.....	88%
	Yolks.....	do.....	126%
	Average.....		104%

NOTE.—The rate fixed in the Tariff Act of 1930 was 15 cents per pound, which was increased to 27 cents per pound, effective July 24, 1931, by Presidential proclamation under section 336 of the tariff act.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds).....	10, 039	1, 246	11, 284	Percent 11
Value (\$1,000).....	(?)	323	(?)	.....
Unit value (cents per pound).....	(?)	26	(?)	.....

¹ Production for export is not separately reported, but is known to be very small.
² Not available.
³ Foreign value.

Before 1931, when the duty on dried egg products was raised from 18 to 27 cents per pound by Presidential proclamation after an investigation by the United States Tariff Commission under section 336 of the Tariff Act of 1930, the commercial production of these items in the United States was small. After the duty was raised, imports, all from China, declined greatly, and the United States production

showed a corresponding increase. This gain in production during 1932-34 was, however, in part the result of low prices for shell eggs in this country for several years after 1931. Imports increased in 1935-37; after the Japanese overran eastern China in 1937, imports again fell, and United States production rose sharply. All facts considered, 1935-37 was probably a more representative pre-war period for production, imports, and United States consumption of dried egg products than 1932-34, when apparent consumption was low but was augmented by stores accumulated previously. About 0.2 percent of total production of chicken eggs in 1935-37 went into the making of dried eggs. The data for 1935-37 follow:

Item	1936	1935-37	1932-34	Ratio of 1936 to 1935-37
	1,000 pounds	1,000 pounds	1,000 pounds	Percent
Production.....	10,080	2,288	2,461	428
Imports.....	1,245	7,608	2,438	16
Apparent consumption.....	11,324	9,891	4,894	112

During the pre-war period both production and imports consisted principally of dried yolks and albumen, dried whole eggs amounting to less than 5 percent of consumption. Yolks are used chiefly in ice cream and ice-cream mixes, noodles and macaroni, and in prepared cake and pastry, particularly doughnut flours; albumen is used principally in cream-center, bar and nougatine candies, baking powders, meringues and marshmallow whips, prepared flours, in sensitizing photographic plates, and as a "fixing" agent in textile printing. Dried whole eggs normally are used chiefly by wholesale bakers and in prepared flours.

Since 1940 the United States production and exports of dried egg products has been expanded greatly as a war measure, for the supply of the armed forces of the United States and particularly for shipment to allied nations under Lend-Lease. The total production increased from 7.5 million pounds in 1940 to 45.3 million in 1941, to 235.7 million in 1942, and 319.8 million pounds in 1944. In 1942 and 1943 the production of dried eggs used practically 16 percent of total production of chicken eggs in this country. A preponderance of the production and particularly of Government purchases (which have accounted for about 90 percent of the output in 1941-44) has consisted of dried whole eggs to provide a concentrated "protective" food which could be stored more or less indefinitely without refrigeration. This wartime mushroom increase can be only temporary. Just as in the pre-war years, post-war exports will probably be negligible, especially after United States armed forces have returned home.

POST-WAR SHORT TERM

In this period United States production and exports will probably decline swiftly. Imports are expected to be resumed in substantial volume within a year or two after the Japanese are evicted from China unless the large egg-drying plants in that country are left in ruins by the war. Should the latter be the case, the resumption of egg drying in China will probably be delayed 1 or 2 years longer, until approximately the end of this period.

POST-WAR LONG TERM

Per capita income at 1939 level.

Per capita consumption is expected to be about the same as in the 1935-37 period, resulting in a total consumption approximately 10 percent larger, or about 11-12 million pounds, depending to some extent on the assumptions of duty. Domestic exports would doubtless remain insignificant. United States production and imports, however, would probably vary greatly with changes in the duties, since the Chinese egg-drying industry will doubtless have been rehabilitated and become sharply competitive with domestic egg driers, just as in 1935-37.

Duty as in 1939.—With prices substantially unchanged imports might supply about 75 percent of United States consumption and might reach approximately 8-9 million pounds, with a foreign value of about 2.1 to 2.3 million dollars. Should this estimate of imports prove to be correct then United States production might be about 2-3 million pounds, with a value of approximately 1 to 1.4 million dollars.

Duty reduced by 50 percent.—Domestic production would probably be 0.5-1 million pounds, with a value of \$250,000 to \$450,000. Imports might amount to 11 million pounds per year, with a foreign value of perhaps 3.5 million dollars, and might supply up to 95 percent or more of United States consumption.

Duty increased by 50 percent.—Domestic production might amount to as much as 9.5 million pounds, valued at about 5.7 million dollars, compared with imports of about 1.5 million pounds, and a foreign value of approximately \$300,000.

Per capita income 75 percent higher than in 1939.

The total consumption would probably average about 11.5-12 million pounds, or 15 percent larger than in 1935-37 by reason of a larger consumption of food items in which dried egg products are used. According to changes in the duty, however, domestic production and imports could be expected to vary within wide limits. Domestic exports would doubtless be insignificant.

Duty as in 1939.—Imports would probably total about 8.5-9.5 million pounds, with a foreign value of approximately 3.3-3.7 million dollars, and would supply about 75 percent of United States consumption. It is likely that domestic production would be approximately 2-3 million pounds, with a value of 1.3-2 million dollars.

Duty reduced by 50 percent.—In these circumstances it is likely that domestic production would not be over 0.5-1 million pounds, with a value of \$300,000 to \$600,000. Imports of approximately 11 million pounds would be probable, with a foreign value of about 4.4 million dollars, and would supply up to 95 percent of United States consumption.

Duty increased by 50 percent.—A domestic production of about 9.5 million pounds could be expected, with a value of approximately 6.8 million dollars. Imports would be approximately 2 million pounds, with a foreign value of probably \$660,000.

HORSES

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
714-----	Horses: Valued at not more than \$150 per head.	\$15 per head....	21%
	Valued at more than \$150 per head.	17½% ad val....	
1606 (a)-----	For breeding.....	Free.....	

NOTE.—The rates fixed in the Tariff Act of 1930 on dutiable horses were \$30 per head on those valued at not more than \$150 per head, and 20-percent ad valorem on those valued at more than \$150. The \$30 rate was reduced to \$20 on January 1, 1936, and further to \$15 on January 1, 1939, pursuant to trade agreements with Canada. The 20-percent rate was reduced to 17½ percent, effective January 1, 1939, pursuant to trade agreements with Canada and United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Appar-ent con-sumption	Ratio (percent) of im-ports to con-sumption
	Total	For ex-port	For domestic market			
Horses, other than for breeding purposes (dutiable)						
Quantity (number).....		676		1 6,434		1
Value (dollars).....		202,370		\$ 876,180		
Unit value (dollars per head).....		299.36		136.18		
Horses, for breeding purposes (free)						
Quantity (number).....		\$ 154		\$ 415		
Value (dollars).....		82,695		\$ 312,180		
Unit value (dollars per head).....		536.98		752.24		
Horses (total)						
Quantity (number).....	\$ 635,000	830	634,170	6,849	641,019	1.1
Value (\$1,000).....	51,613	265	51,328	\$ 1,188	52,516	
Unit value (dollars per head).....	81.28	343.45	80.94	173.51		
Persons employed.....	(9)					

1 Of this number 296 were valued at over \$150 each for total value of \$252,335.

2 Foreign value.

3 Exported as breeding animals and comparable with imports in this classification.

4 Of this amount 126 were males valued at \$156,555.

5 The "production" of horses in any year is the number which reached the age of 4 years in that year.

6 No statistics available. The "production" of 635,000 horses would represent the work of about 9,600 men a year for 4 years.

The number of horses in this country declined from 21.5 million head in 1919 to 10.6 million head in 1939, and to 9.7 million head in 1943. Based on census reports, the estimated number of horses in cities (exclusive of the number on farms) in 1910 amounted to 3.2 million, but in 1930 it was only 300,000. The number of horses reaching the age of 4 years in any year, which is reckoned as production, amounted to 741,000 in 1925, to 635,000 in 1939, and to 568,000 in 1944. In the period 1934-38 there was some increase in horse breeding, but subsequently the decline was resumed, and is expected to continue.

Imports are classified in four groups: (1) Duty-free, for exhibition purposes, (2) duty-free, consisting of work teams of immigrants, (3) duty-free as registered purebreds, and (4) dutiable. Only the last two groups are of any importance from the point of view of the number imported. The purebred horses admitted free for breeding purposes in 1939 came principally from the United Kingdom, Argentina, Canada, and France. The horses that are imported subject to duty are chiefly well bred (but not purebred) work horses from Canada, but include a small number of purebred geldings for riding, jumping, and polo from the United Kingdom, Chile, Canada, and Argentina. Of total imports, free and dutiable, 90 percent were dutiable and valued at less than \$150 per head.

POST-WAR SHORT TERM

Present information indicates that in the period immediately after the war the number of horses on farms and the number of colts reaching working age will probably be smaller than in 1939. Imports might be somewhat larger than in 1939 but exports are likely to be at about the 1939 level.

POST-WAR LONG TERM

Consumption, Production, and Imports

The trend in the breeding and raising of horses is definitely downward, and in the long period after the war the annual production, i. e., the number to reach the age of 4 years in any year, will probably be 300,000-350,000 head, valued at 28.0-36.6 million dollars. The consumption will approximate production varying therefrom only by the small number of animals which are likely to be imported, which apparently do not affect production. Imports might be about 1 percent of consumption.

Per capita income at 1939 level.

Duty as in 1939.—Imports might be about the same as in 1939 and amount to about 7,000 animals with a foreign value of slightly over 1 million dollars.

Duty reduced by 50 percent.—With the duty reduced \$7.50 a head, imports might amount to about 9,000 animals, with a foreign value of about 1½ million dollars.

Duty increased by 50 percent.—Imports might amount to about 5,000 animals, with a foreign value of slightly under 1 million dollars.

Per capita income 75 percent higher than in 1939.

With much larger incomes, farmers will probably use even fewer horses, as they will increase their purchases of power machinery. While there might be an increased demand for pleasure horses, the total production of horses is expected to continue to decline. Domestic production might be 10-14 percent smaller than under the lower-income level and amount to perhaps 270,000-300,000 animals, valued at 32-37 million dollars. The number imported, largely work stock, would probably not increase with the increase in national income, but unit values of both domestic and imported animals might be 50 percent higher. Domestic consumption would continue to approximate production and have a value of about 38 million dollars.

Duty as in 1939.—Imports might amount to 7,000 animals, with a foreign value of about 1.8 million dollars.

Duty reduced by 50 percent.—Imports might amount to 9,000 horses with a foreign value of slightly over 2.3 million dollars.

Duty increased by 50 percent.—Imports might amount to 5,000 horses with a foreign value of about 1.3 million dollars.

Exports

Exports of horses in the post-war period will probably amount to less than 1,000.

Employment

In the post-war long-term period annual production of horses might require 5.5 million man-days, equivalent to the full-time employment of 18,000 workers.

FISH FOR HUMAN CONSUMPTION

Tariff paragraphs: 717-721 and 1756.

Commodity: Fish for human consumption.

Rates of duty: Various, or free.

Equivalent ad valorem (1939): Dutiable imports 20%; free and dutiable, 19%.

Note.—The fishery products covered by this report are provided for in the Tariff Act of 1930 under numerous classifications (according to species and method or degree of preparation) carrying many different rates of duty. The rates specified in the act and the changes which have occurred since 1930 are too many to set forth in this report. Some of the original rates of duty were increased under section 336 of the Tariff Act, and many of the rates were reduced pursuant to trade agreements with Cuba (1934), Canada (1936 and 1939), the Netherlands (1936), United Kingdom (1939), Argentina (1941), Mexico (1943), Iceland (1943), and Iran (1944). The average ad valorem equivalent on dutiable imports in 1939, 20.4 percent, would probably have been around 23 percent if all the duties of the act of 1930 had been in effect.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds) ¹	2,352,622	200,631	2,151,991	527,205	2,659,196	Percent 20
Value (\$1,000) ²	146,658	11,893	134,765	³ 23,556		
Value (cents per pound) ⁴	6.29	5.93	6.32	4.47		
Persons employed.....	(⁵)					

¹ Converted to whole fresh fish equivalents.

² Production, as packed or processed for market; imports and exports, as reported in official statistics.

³ Foreign value.

⁴ These averages are to some extent misleading, especially for purposes of comparison between domestic production and imports. See text.

⁵ See discussion under "Employment".

The statistics shown above are conversions to a reasonably comparable basis, as follows: (1) quantities; production is in terms of whole fish (as landed by fishermen) used as food for human consumption; imports and exports are the products imported and exported converted to whole fish equivalents; (2) values; the value of production is the value of the various products as prepared and packed for market; the value of imports is the value as reported in official statistics, in

the various forms in which the imports enter. The value of exports is the value reported in official statistics and represents the value of the domestic products packed for export.

The total catch of fish in 1939 amounted to 4,013 million pounds in terms of round weight, and was made up of approximately 100 species or groups of species, including both fish used for human consumption and inedible fish and other fish, which, though considered edible, were used wholly or partly in the manufacture of fish meal and fish oil, or as bait. The latter group included the entire catch of menhaden and sharks, and the bulk of the catch of pilchards and Pacific sea herring; also an estimated 10 million pounds of various species used for bait. The catch of fish not used for human consumption amounted to about 1,680 million pounds, thus leaving about 2,330 million pounds (in terms of whole fish) for human consumption. The value of the catch of fish for human consumption, in the form in which marketed, was arrived at by tabulating some 200 items of prepared and preserved or processed fish, omitting the value of meal, oil, and all other inedible products prepared from whole fish or from waste from the packing and processing plants. The value of the products processed as food for human consumption was 111 million dollars; it was estimated that fish marketed for human food without processing (i. e., fresh or frozen whole, or not further advanced than beheaded or eviscerated, or both) was valued at 36 million dollars; thus the total value of production as marketed was 147 million dollars.

Imports and exports of approximately 100 items, covering various species of fish and various types of prepared or preserved products (salted, canned, smoked, etc.), were converted to whole-fish equivalents in order that quantities would be comparable with the domestic catch of fish used for food. Imports, in the form in which entered, amounted to 302 million pounds in 1939, but in terms of estimated whole-fish equivalents, totaled 527 million pounds. Actual exports were 112 million pounds, produced from an estimated 201 million pounds of whole fish,

The average values per pound as shown in the table were obtained simply by dividing the total values of products as prepared for market by the quantities of whole fish used. In terms of whole fish, more than 90 percent of domestic production for market consisted of fresh, frozen, and canned fish; about 90 percent of total exports were canned fish, principally sardines, salmon, and mackerel; one-third of imports were fresh or frozen fish, one-fourth canned, and most of the remainder, pickled or salted. The unit value of imports (4.47 cents per pound) was below the levels of domestic production and exports, partly because of the large volume of lower-priced pickled and salted fish in imports, and because the average was based upon the foreign value of the products. If to this figure is added the average import duty, plus an estimated 10 percent for transportation and other charges, then the landed unit value would be about 5.9 cents per pound, or approximately the same as the unit value of United States production for export.

Since the turn of the century there has been a marked shift in the types of fish products as prepared for consumption and the trade in them. The consumption of fresh, frozen, and canned fish has registered pronounced increases, partly at the expense of pickled or salted

products. The per capita consumption of fish increased slightly up to World War II.

Total imports have also increased. The increase in imports of fresh and frozen fish has resulted from an expanding market in the United States; but increasing imports of pickled and salted fish have largely replaced domestic production, the raw fish formerly used by the domestic salting industry having been largely diverted to the more profitable fresh and frozen trade. In recent years imports of pickled and salted fish have supplied about 80 percent of the domestic consumption of fish marketed in that form.

In 1939 the domestic consumption of fish (in terms of whole fish equivalents) amounted to 20 pounds per capita, or 2,659 million pounds, of which 527 million pounds, or 20 percent, was supplied by imports. Of the total consumption (in terms of whole fish), 48 percent was fresh or frozen, 39 percent canned, and 13 percent otherwise prepared or preserved (principally pickled or salted fish and smoked or kippered fish). In terms of tariff treatment, 92.5 percent of the value of imports was dutiable and 7.5 percent free. The calculated ad valorem equivalent of the duties collected on total imports was 18.9 percent and on dutiable imports, 20.4 percent. Data relating to the consumption and imports and tariff treatment of fish in the principal forms are shown in the following table.

Fish for human consumption: United States consumption, imports, and tariff treatment, 1939

[Quantities in terms of whole fish equivalents]

Item	Consumption	Imports				
		Quantity	Ratio to consumption	Value	Duty collected	Equivalent ad valorem
	1,000 pounds	1,000 pounds	Percent	1,000 dollars	1,000 dollars	Percent
Fresh or frozen:						
Free.....	309,482	54,043	17.5	1,755		
Dutiable.....	990,188	126,828	10.3	7,948	984	12
Total.....	1,299,670	180,871	14.0	9,703	984	10
Canned (all dutiable).....	1,035,355	131,442	12.7	8,841	2,738	31
Other prepared or preserved (all dutiable).....	334,171	214,892	64.3	5,012	719	14
Grand total.....	2,659,196	527,205	19.8	23,556	4,441	19

¹ On free and dutiable imports.

Fresh and frozen fish.

Imports duty-free.—Imports under this category consist entirely of sea herring, tuna, and smelts.

Consumption of sea herring, as given in the above table, excludes the Alaskan catch which is used almost entirely for meal and oil. The volume of imports of sea herring (entirely from Canada) is determined almost entirely by the requirements of the Maine sardine canners and the available supplies of suitable fish for these canners in domestic waters. Consequently, the domestic catch and imports have shown marked fluctuations from year to year.

Practically the entire domestic tuna catch, as well as the imports of fresh and frozen tuna, are taken by the Pacific coast canning industry.

Imports of fresh and frozen tuna have never exceeded 10 percent of the total domestic catch and have decreased in recent years; at the same time the domestic catch has increased. Most imports were from Japan and consisted of frozen albacore.

Smelts are marketed fresh or frozen. Annual consumption averages 10 million pounds, of which about two-thirds is supplied by imports, almost entirely from Canada.

Imports dutiable.—Dutiable imports of fresh and frozen fish are subject to specific rates ranging from $\frac{1}{2}$ to 3 cents per pound, according to species and condition. The equivalent ad valorem of the duty collected ranged in 1939 from 1.6 to 32.2 percent but averaged 12.4 percent. In 1939 imports supplied 10 percent of the domestic consumption of fresh and frozen fish in this group (in terms of whole fish).

Formerly most of the consumption of fresh and frozen fish was marketed as whole fish or not further advanced than eviscerated or beheaded and eviscerated. More recently, with improved methods of freezing and marketing, the consumption of fresh and frozen packaged fish (principally fillets) has steadily increased since their introduction in the early 1920's.

This method of packing and marketing fresh and quick-frozen fish has resulted in an increased number of retail outlets for fresh and frozen fish, in that the products are now handled by a great many grocery stores equipped with refrigerating facilities intended primarily for handling other quick-frozen packaged foods. Upon the conclusion of the war, when materials and labor are available, it is believed that expansion of these refrigerating facilities will be resumed, and will be more pronounced in the smaller cities and towns, particularly in the Central States, where the per capita consumption of fish in the aggregate has been the lowest.

Also significant is the recent development of frozen-food locker plants. There are approximately 6,000 such plants in the United States, and it is believed that the construction of new plants will be speeded up after the war. To date little locker space has been used for frozen fish, but the fishing industry anticipates that increasing quantities will be marketed through these outlets in the future.

Some of the post-war increase in consumption of fresh and frozen fish will probably be at the expense of preserved fish, principally pickled or salted (rather than canned or smoked) products. However, it is believed that there will be a substantial net increase in total consumption of fish resulting from increased availability of, and preference for, these packaged frozen products.

The domestic production of fish marketed fresh or frozen includes a wide variety of relatively unimportant species of which there are only negligible imports, if any. However, the bulk of production consists of a limited number of species or related groups of which imports are also large. Of primary importance in both production and imports are (1) lake fish, (2) fillets, etc., principally cod, haddock, hake, pollock, cusk, and rosefish (packaged fish), (3) halibut, (4) salmon, (5) swordfish, and (6) Atlantic mackerel.

The domestic catch of lake fish (mainly from the Great Lakes) has decreased in recent years owing to depletion of certain important species. Under existing conservation measures which will probably become more stringent, it is unlikely that the annual catch will exceed the present 80-85 million pounds. Imports are almost entirely from

Canada (coming both from the Great Lakes and from lakes farther north), and total 50-60 million pounds annually. Although the bulk both of the domestic catch and of the imports are marketed fresh or frozen, there is an appreciable domestic production of smoked and salted lake fish, using domestic and imported raw material.

Fillets and similar forms of fish are prepared from many species; however, at least three-fourths of the domestic production consists of haddock, rosefish, whiting, flounder, and cod; and at least two-thirds of the imports consist of haddock and cod. Domestic production centers in the New England States. Before 1940 imports came almost entirely from Canada (about 80 percent) and Japan (about 15 percent). Since 1940 Canada has continued to be the predominant source of imports, but increasing quantities have arrived from Newfoundland and Iceland. The bulk of the Canadian output, and almost all the output of Newfoundland and Iceland is exported. The United States is the largest consumer of these products. Under the trade agreement with Canada, effective January 1, 1939, the duty on fillets and so forth of cod, haddock, hake, pollock, cusk, and rosefish was reduced from 2½ cents to 1½ cents per pound on an annual quota of 15 million pounds, or of 15 percent of the average annual consumption for the 3 preceding years, should such consumption exceed 100 million pounds. Imports in excess of the quota enter at the statutory rate, which is bound against increase by the agreement. The established quota has exceeded 15 million pounds each year since 1941, and no imports in excess of the quota entered until 1944, when they were fairly large.

The United States-Canadian catch of halibut is controlled by the International Fisheries Commission, which, among other things, sets the total annual quota to be caught by these countries. In 1944 it was 51 million pounds. Although the quota is not allocated between the two countries, in recent years the United States catch has averaged three-fourths of the total. Virtually all of the United States catch is for domestic consumption, mainly fresh or frozen, but Canada exports about half of its catch, also mainly for consumption fresh or frozen, 60 percent of the exports coming to the United States and most of the remainder going to the United Kingdom.

The domestic catch of salmon fluctuates with cycles in the runs of fish and has ranged from 530 million to 790 million pounds annually. Only about 15 percent of the total catch (80 million to 115 million pounds) is marketed fresh or frozen, most of the remainder being taken by canneries, located principally in Alaska. Before the war imports in fresh or frozen form, almost entirely from Canada, averaged 6 million pounds annually, and exports in that form, principally to the United Kingdom, averaged 5 million pounds.

Virtually all swordfish consumed in the United States is marketed fresh or frozen. Since 1933 the annual domestic catch has not exceeded 3.7 million pounds, practically all of which is marketed fresh (not frozen). Although swordfish is relatively high priced, fishing for other and more abundant species is generally more profitable to United States fishermen, with the result that imports normally supply more than half the domestic consumption. Imports have ranged from 3 million to 6½ million pounds annually and have supplied from 50 to 70 percent of annual consumption. Canada supplied about one-third of total imports and Japan most of the remainder. Most of the

imports from Canada consisted of fresh swordfish; all imports from Japan were frozen.

Domestic consumption of mackerel marketed fresh and frozen is influenced from year to year largely by available supplies, which are primarily dependent upon the runs of fish. The United States Atlantic coast catch, which supplies virtually all of the domestic production, fluctuates from year to year, and since 1928 has ranged from 65 million pounds (1935) to 27 million pounds (1937). The catch of Canada is influenced by the same factors. Practically all imports are from Canada, and these on the average supply less than 5 percent of the domestic consumption. Most fresh or frozen mackerel are marketed whole, but there is an increasing production of fresh and frozen packaged fillets.

Canned fish (all imports dutiable).

Sardines, herring, salmon, tuna, and mackerel account for at least 80 percent of the domestic consumption of canned fish, with alewife and alewife roe, anchovies, antipasto, and fish flakes, cakes, balls, and puddings making up most of the remainder. In 1939 imports supplied 12.7 percent of domestic consumption, in terms of whole fish equivalents. All imported canned fish is dutiable at ad valorem rates, ranging (in 1939) from 15 percent to 45 percent, with an average of 31 percent for total imports.

The consumption of sardines packed in oil consists mainly of Maine sardines packed in cottonseed oil and imported Norwegian and Portuguese sardines packed in olive oil. Before the war imports on the average supplied about 45 percent of domestic consumption of this type of sardines. However, consumption, production, and imports have registered sharp and somewhat unrelated fluctuations. From 1923 through 1939 consumption averaged 59 million pounds annually, of which 33 million pounds were supplied by domestic sources and 26 million pounds by imports. There are wide variations in the quality and price of sardines, but the spread is much wider in imported sardines than in the domestic product. At least 80 percent of the pre-war imports consisted of sardines of a grade and price higher than that of the United States production; conversely at least 80 percent of the domestic production consisted of sardines of a grade and price which were not imported.

Consumption of canned sardines and herring not in oil consists principally of Maine sardines and herring packed in mustard or the natural oil of the fish, California pilchards packed in tomato sauce or the natural oil of the fish, imported herring in tomato sauce or in natural oil, and canned kippered herring. Domestic consumption of these products averaged 75 million pounds annually during the pre-war decade. Imports supplied 12 percent of consumption, but were considerably less than United States exports. Most of the imports consisted of kippered herring from Norway and herring in tomato sauce from the United Kingdom. Exports were almost entirely sardines (California pilchards) in tomato sauce.

The United States is the world's largest producer and consumer of canned salmon. Production averages 347 million pounds annually, of which about 90 percent is packed in Alaska. Exports represent about 12 percent of production. Consumption averages 308 million pounds annually, of which less than 1 percent is supplied by imports.

Subject to marked fluctuations from year to year, the United States production of canned tuna has increased greatly in recent decades and amounted to 100 million pounds in 1940. Virtually the entire domestic pack (part of which before the war was from frozen tuna imported from Japan) is consumed in the United States. Imports of canned tuna (85 percent from Japan) reached their peak of 14 million pounds in 1933, when they supplied 31 percent of domestic consumption, but thereafter they declined while production increased. During the 5 years ending 1940 the annual consumption averaged 83 million pounds, of which 10 percent was supplied by imports. The duty on imports was increased from 30 percent to 45 percent ad valorem by Presidential proclamation, effective January 13, 1934, but reduced to 22½ percent in the trade agreement with Mexico, effective January 30, 1943, with reservation of the right to withdraw or modify the reduction after termination of the emergency.

Also subject to marked fluctuations from year to year, the production of canned mackerel has shown a decided upward trend since 1930 with an annual average of 45 million pounds for the 10 years ending 1940. Exports, principally to the Philippine Islands, Italy, and Cuba, have never exceeded 5 million pounds and have averaged 4 percent of production. Imports are negligible and consist mainly of products of a grade and price which does not compete directly with the bulk of the domestic pack.

Practically the entire United States pack of canned alewives and alewife roe is for domestic consumption, and imports, if any, are negligible. There is no domestic production of canned anchovies, and only insignificant quantities of antipasto are produced in the United States, the market for these products being supplied by imports.

With respect to canned fish cakes, balls, and pudding, the United States production has been confined almost entirely to the first two products, with fish cakes accounting for the bulk of the pack. Imports before the war consisted principally of fish balls from Norway and fish puddings, etc., largely oriental specialties, from Japan. Since the elimination of these sources as a result of the war, appreciable quantities of fish balls have been imported from Iceland. Under the Iceland trade agreement, effective November 19, 1943, the duty on these products was reduced from 25 to 12½ percent ad valorem.

Other fish, prepared or preserved (all imports dutiable).

In 1939 consumption of the products covered here, in terms of whole fish, amounted to 334 million pounds, of which 215 million pounds (64 percent) was supplied by imports. Pickled or salted and smoked or kippered fish accounted for the great bulk of consumption. Approximately 80 percent of the consumption of pickled or salted fish was supplied by imports, whereas imports contributed only about 25 percent of the consumption of smoked or kippered fish.

Consumption of pickled or salted fish consists largely of cod and related species, herring, mackerel, and alewives, the last-named being the only species wherein domestic production supplies the bulk of consumption. The United States fishermen catch great quantities of cod and related species and mackerel, but more profitable outlets in the steadily increasing fresh-and-frozen market has diverted a large part of the catch from the pickling and salting industry. Conse-

quently most requirements for these products have been supplied by imports principally from Canada, Newfoundland, and Iceland.

With the exception of certain types of herring, the bulk of the smoked or kippered fish is perishable. Consequently, a large part of the processing is done in or near centers of consumption, which accounts for the fact that domestic production supplies the bulk of consumption.

The duties on practically all imports of pickled or salted fish ranged in 1939 from $\frac{1}{8}$ to $1\frac{1}{2}$ cents per pound, and the duties on smoked or kippered fish ranged from $\frac{1}{8}$ to 2 cents per pound. Insignificant quantities of fish under this category were dutiable at ad valorem rates of 15 percent or 25 percent. The equivalent ad valorem of the duty on total imports of this group in 1939 was 14.3 percent, it was 13.6 percent on pickled or salted fish, 18.6 percent on smoked or kippered fish, and 16.2 percent on other products.

Wartime changes in consumption, production, and imports.

After the attack on Pearl Harbor, the armed forces immediately began the conversion of suitable fishing vessels to war service. This resulted in depleting the fleets of their larger and better vessels, particularly those used for tuna off the Pacific coast and those of the New England trawler and purse-seine fleets. Moreover, naval restrictions closed certain fishing areas and limited operations in others. However, more intensive operations by smaller vessels, together with unusual inshore runs of certain species of fish, resulted in a total catch of 3.4 billion pounds of both edible and inedible fish in 1942, which was only 15 percent below that in 1939. By 1944 the total catch had become nearly as large as in 1939, and the fishing fleet had been practically restored.

The per capita consumption of fish during the war years has shown a marked decline, particularly of preserved products. The Government has taken a substantial part of the output of canned fish, as well as large quantities of fresh and frozen fish, partly for the armed forces and partly for shipment to our allies under lend-lease. Furthermore, imports from Japan and the European countries have virtually ceased, thus eliminating about 55 million pounds of canned fish, principally sardines, herring, tuna, and anchovies.

As a result of these shortages most canned fish is rationed. Fresh and frozen fish, on the other hand, are not rationed, nor were ceiling prices established on most of them until some time after ceilings were placed on most other foods. The resultant higher ceiling prices for fresh and frozen fish have not curbed the demand because of the greater scarcity of other meats and the fact that the purchase of practically all meats and most canned fish requires ration points. Moreover, supplies have been augmented by substantially increased imports of fresh and frozen products from Canada, Newfoundland, Iceland, and Mexico. Consequently the consumption of fresh and frozen fish has been maintained or perhaps increased, while the civilian consumption of canned and cured fish has sharply declined.

POST-WAR SHORT TERM

The total consumption of fish may be expected to exceed that of 1939. The prices, which increased much more than those of meat during the war, may be expected to be considerably below their

wartime highs, but above the 1939 level. Imports will probably supply a somewhat larger part of total consumption than they did before the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Changes of 50 percent in rates of duty would probably increase or decrease consumption slightly, but the effect (uncertain in any case) would be too small to warrant separate estimates under the several duty assumptions.

Duty as in 1939.—The United States consumption of fish will probably be greater than it was before the war, and might be somewhat over 3,100 million pounds (in terms of whole fish equivalents) or an increase of about one-sixth more than in 1939. Such a quantity would represent a per capita consumption of about 21½ pounds, or about 8 percent greater than that in 1939. This increase is predicated primarily upon probable further expansion of facilities for marketing fresh and frozen fish (particularly packaged fish) and consequent increase in both production and imports of these products.

Domestic production, not including that for export, might be about 2,450 million pounds (in terms of whole fish equivalents) and, having an average unit value above that in 1939 (because of the more advanced condition of the products as marketed), may be valued at 178 million dollars. This represents an increase over 1939 of 15 percent in production for domestic consumption with a value increase of 21 percent.

Imports of fish for food might total about 650 million pounds (whole fish equivalents), valued at about 31 million dollars, foreign value. This would represent an increase of about 25 percent in quantity and 35 percent in value over the imports in 1939, and is believed probable because of the anticipated expansion of the United States market, and because of the increased production in foreign countries of frozen fillets and other fish products for which there will probably be an increased demand in the United States. Such increased imports would represent 21 percent of the estimated total consumption (in terms of whole fish) as compared with 20 percent in 1939.

Duty reduced by 50 percent.—With respect to the dutiable products as a whole, changes of 50 percent in the duties would probably not greatly alter the 1939 ratio of imports and production to consumption. However, the situation would vary considerably among the several specific products or related groups of products. For example, the duties on most imports of fresh or frozen fish (except fillets, etc.) and pickled or salted fish are low; therefore, an increase or decrease of 50 percent would, of itself, have relatively little effect upon the volume of imports. A 50-percent change in the duties on fresh and frozen fillets, etc., however (1½ cents per pound or 2½ cents per pound), would probably have a noticeable effect upon the volume of imports, especially if the present quota limitation on imports at a reduced rate of duty should be removed.¹ The effect of such reduction in

¹ Even, however, if the quota provision should be retained, the reduced duty on imports in excess of the quota would be only 1½ cents per pound (as compared with 1½ cent for imports within the quota) and imports in excess of the quota might be large.

duties on canned fish would be more pronounced. Sardines packed in oil are dutiable at 44 percent ad valorem if valued at not more than 9 cents per pound and 30 percent ad valorem if valued at more than 9 cents per pound. In 1939 the duty on canned tuna was 45 percent ad valorem; on other canned fish it ranged from 15 to 44 percent, but the great bulk of imports was dutiable at 25 or 30 percent.

In view of the foregoing it is estimated that with a 50-percent reduction in duties, United States production for the domestic market might be somewhat smaller than with no change in duty and amount to about 2,425 million pounds. Inasmuch as prices would tend to be somewhat lower, the value of such production might be around 175 million dollars. Imports might be larger than with no change in duty, amounting to about 680 million pounds, or 22 percent of estimated consumption, and, since the price received by foreign sellers might be somewhat higher than at the lower duty level, the foreign value of imports might approach 35 million dollars.

Duty increased by 50 percent.—In this situation production for the domestic market might be as large as 2,475 million pounds annually, and, at prices slightly above those which may be expected with no change in duty, the total value might approach 180 million dollars. Imports might total 620 million pounds, or about 20 percent of total consumption, and, at slightly lower prices to foreign sellers, the total foreign value might be about 28 million dollars.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—The quantity of fish consumed in the United States would probably rise only slightly with an increase in the per capita income. But the value of the consumption would probably be influenced by two factors: (1) generally higher prices for fish and (2) increased consumption of the more desirable, higher-priced products at the expense of the cheaper products. With generally better methods of distribution for fresh and frozen fish, higher incomes would probably lead to increased consumption of packaged fish, and of such high-priced fresh or frozen fish (generally not packaged) as halibut, salmon, swordfish, and several kinds of lake fish, provided adequate supplies are available. Such a shift in consumption may also lead to increased purchases of the relatively higher-priced canned products, such as tuna, red salmon, and the better grades of domestic and imported sardines. In the case of fresh and frozen fish, decreases would probably be registered in the consumption of some of the cheaper and lesser-known species, which generally are not packaged but marketed whole. There might also be a decreased demand for the cheaper grades of canned fish, such as mackerel, alewives, and the lower grades of salmon, sardines, and herring. Consumption of the cheaper grades and species of pickled or salted fish might also decline as a result of high income.

In view of these considerations it is estimated that consumption under the high income level might be 6 to 8 percent greater than at the low income level or about 3,300 million pounds. United States production, excluding that for export, might be about 2,600 million pounds and imports (with duties as in 1939) might be about 700 million pounds. For the reasons given above, average values per pound might be about 50 percent above those in 1939, with the result that the total value of production for the domestic market might

approach 250 million dollars, and the foreign value of imports be in the neighborhood of 47 million dollars. In this event imports would supply about 21 percent of consumption in quantity.

Duty reduced by 50 percent.—Imports might supply about 750 million pounds, or 22.5 percent of total consumption, and, with somewhat higher prices to foreign sellers, the foreign value might approach 53 million dollars. Production for the domestic market might be about 2,575 million pounds, valued at 235 million dollars.

Duty increased by 50 percent.—Stimulated by comparatively high prices, domestic production for the domestic market may total 2,625 million pounds, with a value of about 260 million dollars. Imports may be 650 million pounds, with a foreign value of 42 million dollars.

Exports

In 1939 United States exports of fish for food amounted to 201 million pounds in terms of whole fish (112 million pounds as exported) valued at 12 million dollars (as exported). About 90 percent in volume and value consisted of canned fish, principally salmon, sardines in tomato sauce, and mackerel, packed in the Pacific Coast States and Alaska.

It is unlikely that exports of fish other than canned will register an appreciable change. There are, however, possibilities in the canning trade. United States salmon and sardines had virtually world-wide distribution before the war, although 80 percent of the salmon (principally the higher grades) and 20 percent of the sardines went to the United Kingdom. Most of the sardines and a large part of the mackerel went to the Philippine Islands and other Asiatic countries, and West Indian, Central, and South American countries.

In most of these markets there is little or no production of canned fish of a grade and price comparable to sardines, mackerel, and the cheaper grades of salmon. The products are imported by them principally from Japan and the United States. As Japan was a supplier of increasing importance before the war, the inability of that country to resume production for export, or a sustained aversion for products of Japan in these markets, could lead to a substantial increase in United States exports.

Employment

Data are not available showing the number of persons engaged in catching and processing fish and shellfish for human consumption. However, as the industry is predominantly engaged in the production of food for human consumption, and as most nonfoods are generally byproducts or coproducts of the food industries, available details for the industry as a whole are given.

In 1939 the fishermen of the United States and Alaska caught 4.4 billion pounds of marine products with a value to them of 97 million dollars. About 131,000 fishermen were employed in making this catch, of which 69,000 were regular and 62,000 casual. The fishermen used 5,413 powered fishing vessels of more than 5 net tons each, together with 2,083 accessory boats. Fishing boats of 5 tons or less each numbered 68,634, of which 31,899 were powered.

The packing and processing industry employed 4,790 persons on 1,396 transporting vessels and 1,017 boats. In addition there were

3,104 plants operated by 2,809 proprietors who employed 5,598 regularly salaried employees, and an average of 84,000 wage earners who worked a total of 38,000 man-years.

SHELLFISH FOR HUMAN CONSUMPTION

Tariff paragraphs: 721, 1761, and 1700.

Commodity: Shellfish for human consumption.

Rates of duty: 15% to 35% ad val, *Equivalent ad valorem (1939):* Dutiable, 16%; free and dutiable, 8%.
8¢ per lb., or free.

NOTE.—The rates fixed in the Tariff Act of 1930 were as follows: Canned clams and clam chowder, 35 percent ad valorem; canned oysters, 8 cents per pound; canned crab meat, 15 percent ad valorem; other shellfish (the principal imports being lobsters), duty-free. By Presidential proclamation under section 336 of the Tariff Act, effective May 31, 1934, the duty on canned razor clams was reduced to 25 percent, and the duty on other clams was changed to 35 percent on the basis of American selling price of the similar competitive article. The duty on clam chowder remained 35 percent on the basis of foreign value. The duty on canned razor clams was further reduced to 15 percent, effective January 1, 1936, pursuant to trade agreements with Canada. The duty on canned crab meat was increased from 15 to 22 percent ad valorem, effective September 21, 1941, by Presidential proclamation under section 336 of the tariff act.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000) ¹	47,808	1,688	46,120	10,482	56,602	Percent 19
Persons employed.....	(²)					

¹ Production as packed or processed for market; imports and exports as reported in official statistics. Statistics of quantity would have little significance on account of the wide spread between gross weight and processed weight of certain species, and the various forms in which the products are marketed.

² Estimated landed value; foreign value was \$8,848,000.

³ See subsection on employment in section on fish for human consumption.

In the absence of comparable data on quantities, the statistics in this report are based upon values, which are believed to represent reasonably well the United States production of and trade in these products. Omitted from consideration are horseshoe crabs, used entirely in the manufacture of shellfish meal, fresh-water mussel shells, used in the manufacture of buttons, novelties, lime, and poultry feed, and sand shrimp used for bait.

The value of production, as shown in the above table, consists of published statistics covering all processed and packaged shellfish (including crustaceans) and the estimated value of the quantity marketed unpackaged and unprocessed. The value given for imports represents the landed value duty-paid, which is the foreign value, in the form in which it is imported, plus duties collected and the estimated cost of transportation and other charges. The value of exports represents the value of the products as packed for shipment.

More than 90 percent of the domestic consumption and production of shellfish before the war consisted of shrimp, crabs, lobsters, oysters, clams, and scallops. Fresh and frozen shellfish accounted for approximately one-third of the quantity (in the condition marketed) and two-thirds of the value of consumption; canned products represented one-half of the quantity and almost one-third of the value.

Commercial production, as marketed, consisted principally of oysters and clams fresh-shucked, in the shell, and canned; fresh, frozen, and canned shrimp; fresh-cooked crab meat; live lobsters; and fresh-shucked scallops. Imports were principally canned crab meat; lobsters, live, frozen, and canned; fresh and frozen shrimp; and clams in the shell and canned. Exports were principally oysters in the shell or shucked; and canned and dried shrimp. On the basis of values, imports (landed value) supplied 18.5 percent of consumption, and exports were 4 percent of production. The relative importance of the principal shellfish in production and imports is shown in the following table:

Shellfish: United States production, and imports and duty status, 1939

Item	Production		Imports		Duty status
	Value as marketed	Percent of total value	Foreign value	Percent of total value	
	<i>1,000 dollars</i>		<i>1,000 dollars</i>		
Oysters.....	12,529	26.2	123	1.5	41% dutiable, 59% free.
Clams.....	10,234	21.4	179	2.0	73% dutiable, 27% free.
Shrimp.....	10,064	21.1	260	3.0	Free.
Crabs.....	5,799	12.1	4,565	51.8	99%+dutiable.
Lobsters.....	5,561	11.6	2,981	33.1	Free.
Scallops.....	1,621	3.4	91	1.0	Do.
Other.....	2,000	4.2	669	7.6	Do.
Total.....	47,808	100.0	8,848	100.0	
Total, free.....			4,052	46.1	
Total, dutiable.....			4,796	53.9	

Shellfish are generally higher priced than other fish products or meats. Therefore, the demand for and prices of these products are relatively more sensitive to changes in economic conditions than are those for many other foods.

All imports of shellfish are duty-free, except canned crab meat, canned oysters and oyster products, and canned clams and clam products. In terms of foreign value, however, 54 percent of the imports in 1939 were dutiable and 46 percent were free of duty. As 96 percent of the total value of dutiable imports consisted of canned crab meat, dutiable at 15 percent ad valorem,¹ the equivalent ad valorem of the duty on all dutiable shellfish was 16 percent.

Canned oysters are dutiable at 8 cents per pound, the average ad valorem equivalent of which was 35 percent in 1939. The other products were in 1939 dutiable at ad valorem rates as follows: canned razor clams, 15 percent; canned clams (other than razor clams), 35 percent, based on the American selling price; and canned clam chowder, juice, etc., 35 percent.

The consumption of shellfish did not register an appreciable decline during the first year or two following the United States entrance into the war. Indeed, domestic production in 1940, 1941, and 1942 was somewhat larger than in 1939. This was owing to the fact that fishing operations are relatively close to shore so that most of the vessels used in this branch of the fisheries are small and that a great many of them are without motive power or equipped only to use outboard motors. Therefore, this fishery lost relatively little equipment when

¹ The duty on canned crab meat was increased to 22½ percent by Presidential proclamation, effective September 21, 1941.

the armed forces took over fishing craft adapted to naval and other military uses. However, the production of shellfish for food in 1943 and 1944 was considerably less than in the three preceding years, and about 90 percent of the 1939 production. This decrease in production may be attributed almost entirely to the loss of fishermen and shore labor to the armed services and to war industries where wages were much higher than returns from the fishery.

The war has also resulted in decided changes in the quantity, value, and sources of imports. There was a marked decline in the quantity of shellfish imported in 1944 as compared with 1939, but there was a decided increase in the total value of the imports, the average unit value having almost doubled. Imports from Asiatic countries practically ceased, which eliminated canned crab meat from Japan, formerly one of the most important imported products. However, substantial increases were registered in the imports of canned razor clams, fresh scallops, and fresh and canned lobsters from Canada and of lobsters, shrimp, and abalone from Mexico.

The decline in total imports was offset by a decrease in exports, which, in 1944, were only about one-fifth of the annual exports during pre-war years. However, increasing purchases by the armed forces, together with decreased production during 1943 and 1944, have reduced supplies available for civilian consumption. During the war a relatively larger proportion of the domestic production has been marketed fresh or frozen and less in canned form. This trend is expected to continue after the war.

POST-WAR SHORT TERM

The per capita consumption of shellfish will probably be slightly higher than in 1939. Increased production and a probable decline in exports may be expected to increase the domestic supply during the short term. Prices are expected to be considerably below 1943-44 levels, but considerably above those prevailing in 1939.

Imports of shellfish are not likely to exceed those of 1939 in quantity and may be slightly less in value. In that year 30 percent of the quantity (as imported) and 52 percent of the value of total imports consisted of canned crab meat—almost entirely from Japan. It is unlikely that this trade will resume its former importance at least for some years after the war. However, compensating increases in imports of other shellfish from other sources may be realized. These will probably consist of shrimp, abalone and lobsters from Mexico, lobsters from the Union of South Africa and West Indian countries, scallops, lobsters, and clams from Canada, and lobsters from Newfoundland.

POST-WAR LONG TERM

Consumption, Production, and Imports

The domestic market for shellfish will probably be considerably greater than it was in 1939. Developments in the methods of packaging, transporting, storing, and displaying fresh and frozen foods, which have already occurred and which will probably be accelerated following the removal of wartime restrictions, are expected to make increased quantities of shellfish available throughout the interior areas. Heretofore, the great bulk of the consumption of these

products has been confined to the Coastal States. Even with a level of income no greater than in 1939, therefore, per capita consumption of shellfish would be expected to be greater than in that year. At a high level of income the demand for shellfish, several classes of which are luxury or semiluxury foods, would be particularly great, and, if supplies should prove to be available, the consumption would be materially increased.

Proved domestic sources of shellfish are limited, and foreign sources, though less well known, are undoubtedly limited also. It is believed that the domestic output of oysters, which in 1939 accounted for over one-quarter of the total value of domestic shellfish, could be increased materially; under favorable conditions it might become 20 to 30 percent greater than in 1939. Similarly the domestic catch of clams, shrimp, and crabs might be increased appreciably, although probably not as much as oysters. There seems, however, little possibility of increasing the output of lobsters and scallops.

It is likely that imports of shrimp from Mexico, scallops and clams from Canada, and lobsters from the Union of South Africa and West Indian countries are capable of substantial increase, although lobsters from Canada and Newfoundland, like those from domestic sources, are believed to be narrowly limited in supply. Imports of canned crab meat could probably be increased as far as the supply of crabs is concerned, but the status of the Japanese fishing industry after the war is uncertain, and the imports may actually fall off from the 1939 level. For the purpose of this report it is assumed that imports of canned crab meat at approximately the 1939 magnitude will be resumed in the post-war long term; if not from Japan, then from whatever country takes over the Japanese crab-catching and canning operations.

Per capita income at 1939 level.

Duty as in 1939.—In view of the anticipated development in marketing facilities, per capita consumption of shellfish would be expected to exceed that of 1939. Allowing also for a 10-percent increase in population, the total consumption of shellfish (in terms of quantity) may be 15 percent greater than 1939 and, at prices somewhat above the low level of that year, have a total value in the neighborhood of 70 million dollars (25 percent more than in 1939). Domestic production and imports would probably contribute to the total supply in substantially the same proportions as they did in 1939, and increased production for the domestic market might be valued at about 57 million dollars.

As indicated above, the predominant factor influencing imports of shellfish will be the status of the Japanese canned crab meat. If the imports of canned crab meat continue large after the war, the foreign value of total imports of shellfish might be around 11.5 million dollars (13 million dollars landed value) or substantially the same percentage of domestic consumption as in 1939.

Duty reduced by 50 percent.—The imports of canned crab meat, clams and oysters would probably increase considerably, but total imports (largely duty-free) and total consumption might increase only moderately, and little change occur in domestic production. Total consumption might be valued at 71 million dollars (1 million more than with unchanged duties) and production for the domestic market be valued at 57 million dollars. The foreign value of imports

might be about 12.5 million dollars (landed value about 14 million dollars).

Duty increased by 50 percent.—Consumption might be valued at about 69 million dollars. Production for the domestic market (being probably as before), about 57 million dollars, the foreign value of imports might be around 10.5 million dollars (landed value about 12 million dollars).

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—The demand for shellfish, particularly for lobsters, shrimp, oysters, and crab meat, would be considerably greater than at the lower income level. The probable limitation of supply might prevent the actual consumption of these products from increasing correspondingly, and actual consumption of shellfish as a whole might, in quantity, be only about 10 percent greater than at the lower income level. The prices of these products may rise somewhat more than those for foods as a whole, and the total value of consumption might approximate 105 million dollars or 60 percent higher than at the 1939 income level. Production for the domestic market might be valued at around 85 million dollars.

If the Far Eastern canned crab meat industry is fully resumed after the war (whether in Japanese or other hands), the foreign value of total imports might be about 18 million dollars (landed value 20 million dollars).

Duty reduced by 50 percent.—Total consumption might be valued at about 107 million dollars, and production for the domestic market at around 85 million dollars. The foreign value of imports might be about 20 million dollars (landed value 22 million dollars).

Duty increased by 50 percent.—Consumption might be valued at about 103 million dollars and production for the domestic market at 85 million dollars. The foreign value of imports might be 16 million dollars (landed value of 18 million dollars).

Exports

In 1939 United States exports of shellfish for food were valued at 1.7 million dollars. Shrimp accounted for 72 percent of the total value, oysters 19 percent, and other products 9 percent. About two-thirds of the total exports (in value) consisted of canned products. Three-fourths of the exports of shrimp were canned and most of the remainder were dried.

In view of anticipated increasing domestic demand for fresh and frozen shellfish, it is believed that domestic production of canned and dried products will decrease and be accompanied by decreasing exports of these products. It appears likely, therefore, that exports of canned and dried shrimp will not revert to their pre-war volume. Although exports of oysters, both in the shell and fresh-shucked, may reach, or even exceed pre-war levels, if the Canadian and United Kingdom markets are restored, it is believed that total exports of shellfish may actually decrease in quantity, but that the value may rise to 2 million dollars, as the result of substantially higher prices. Increase in national and world income would not tend to increase exports.

Employment

See discussion in section on fish for human consumption.

BARLEY MALT

Tariff paragraph: 722.
Commodity: Barley malt.
Rate of duty: $\frac{3}{4}$ ¢ per lb.

Equivalent ad valorem (1939): 19%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For ex- port	For do- mestic market			
Quantity (1,000 bushels)..... (34 pounds per bushel)	64,874	374	64,500	2,974	67,474	Percent 4.4
Value (\$1,000).....	55,117	480	54,637	12,141		
Unit value (per bushel).....	\$0.85	\$1.30	\$0.85	\$0.72		
Persons employed (number).....	1,902					

1 Foreign value.

About 85 percent of the total consumption of malt is used in the manufacture of fermented malt beverages, distilled liquors, and alcohol. The remainder is used in the manufacture of coffee substitutes, malt flour, yeast, vinegar, breakfast foods, and various types of malt sirups.

Production of malt reached a peak of 67 million bushels in 1937 valued at 88 million dollars. In 1939 the quantity of malt produced was about normal, but the value was probably less than normal because the price per bushel of malting barley was only about 55 cents, compared with 78 cents in 1937.

In 1943, malting houses were operating at a capacity of 97 million bushels, of which 65 million bushels were allocated to the brewing industry, and the remainder to the war program—22 million bushels for industrial alcohol, 8 million for food products, and 2 million for export.

In 1937, imports amounted to about 14 percent of consumption, compared with 4 percent in 1939. In 1935-37, when barley supplies suitable for malting purposes were low in both United States and Canada because of the drought, European countries supplied about 80 percent of total imports of malt. In 1938 and 1939, with normal crops in the United States and Canada, practically all imports came from Canada. It seems likely that Canada, which produces malt similar to that produced in the United States, will be the principal source of imports of malt in the post-war period.

POST-WAR SHORT TERM

Because the consumption of malt is largely dependent upon the manufacture of alcoholic beverages, the changes in consumption of these beverages will largely determine the quantity of malt consumed. During the short term the per capita consumption of malt beverages may be about the 1943 level, which was about one-third greater than 1939. Assuming an increase of 5 percent in population, the total consumption in the short term would be 35 to 40 percent above 1939.

Production and imports would probably supply about the same percentages of total consumption as they did before the war when production supplied 90 to 95 percent and imports, 5 to 10 percent.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Assuming an increase of 10 percent in population and an estimated 12 percent increase in the per capita consumption of alcoholic beverages, total consumption of barley malt may be about 22 percent higher than in 1939, or about 82 million bushels. Prices may be about 25 percent above the less-than-normal price of 1939.

Duty as in 1939.—Imports are likely to be about 3.7 million bushels, or about 4.5 percent of consumption and to have a foreign value of about 2.7 million dollars; production may total about 78 million bushels, valued at about 82 million dollars.

Duty reduced by 50 percent.—Imports would probably increase considerably, to about 6-9 million bushels, with a foreign value of about 4.4-6.6 million dollars, and would supply 7-11 percent of total consumption. Production would total about 73-76 million bushels, valued at 77-80 million dollars.

Duty increased by 50 percent.—Only the higher quality of barley malt is likely to enter. Imports might be about 3.0 million bushels, with a foreign value of about 2.4 million dollars, and would supply about 3.5 percent of total consumption. Production would probably amount to about 79 million bushels, valued at 83 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of barley malt would probably be about 40 percent higher than with per capita income as in 1939, or about 115 million bushels. Prices may be about 20 percent above the average pre-war level or close to 45 percent higher than in 1939, when they were below normal.

Duty as in 1939.—Imports would probably be about 5 million bushels, with a foreign value of about 5 million dollars, but supply about 4.3 percent of total consumption. Production would probably be about 110 million bushels, valued at about 132 million dollars.

Duty reduced by 50 percent.—Imports would probably increase to about 9-12 million bushels, with a foreign value of about 9-12 million dollars, and supply 8-11 percent of total consumption. Production will probably be about 103-106 million bushels, valued at about 124-127 million dollars.

Duty increased by 50 percent.—Imports will probably be only slightly less than with no change in duty, because malt of high quality will probably continue to enter. Imports may total about 4 million bushels, with a foreign value of about 4 million dollars and may supply 3.5 percent of total consumption. Production will probably be about 111 million bushels, valued at 133 million dollars.

Exports

Exports of barley malt have been relatively small, ranging from a low of 28,000 bushels, valued at \$41,000 in 1935, to 374,000 bushels valued at \$450,000 in 1939. Most of the exports go to Mexico and South American countries. Post-war exports are not likely to be important.

Employment

Relatively few people are employed in the malting industry. In 1939, 1,902 people were employed in 52 establishments producing malt as compared with 2,014 people in 56 establishments in 1937. An increase in production in the post-war period would probably be accompanied by a proportional increase in employment. The number of persons employed would probably be between 2,300 and 3,200.

FEED GRAINS

Tariff paragraphs: 722, 723, 724, 726, 728, 729, 763, and 1558.

Commodity: Feed grains.

Rates of duty: Various. (See note.) *Equivalent ad valorem (1939):* 25%.

NOTE.—The rates of duty on the commodities covered by this section are as follows:

Commodity	Tariff Act of 1930 rate	Rate on July 1, 1939
Corn:		
General rate.....	25¢ bu. of 56 lbs.....	25¢ bu. of 56 lbs.
Cuban rate.....	20¢ bu. of 56 lbs.....	10¢ bu. of 56 lbs. ¹
Oats.....	18¢ bu. of 32 lbs.....	8¢ bu. of 32 lbs. ²
Barley.....	20¢ bu. of 48 lbs.....	15¢ bu. of 48 lbs. ³
Grain sorghums:		
If germination qualities not destroyed.	2¢ per lb.....	2¢ per lb.
If germination qualities are lost.	10% ad val.....	10% ad val.
If germination qualities artificially destroyed.	20% ad val.....	20% ad val.
Rye.....	15¢ bu. of 56 lbs.....	12¢ bu. of 56 lbs. ³
Buckwheat.....	25¢ per 100 lbs.....	15¢ per 100 lbs. ³
Wheat unfit for human consumption.....	10% ad val.....	5% ad val. ³

¹ Pursuant to trade agreement with Cuba, effective September 3, 1934.

² Pursuant to trade agreement with Canada, effective Jan. 1, 1939. In the first Canadian agreement, effective Jan. 1, 1936, the duty on hulled oats unfit for human consumption had been reduced from 10¢ to 8¢ per bu. In the second agreement the reduction was extended to all hulled and unhulled oats.

³ Pursuant to trade agreements with Canada, effective Jan. 1, 1939. The commodities covered by this report, except grain sorghums, and buckwheat, were admitted free of duty if used for feed for livestock during the period December 23, 1943, to June 19, 1944, under Public Laws 211 and 272 of the 78th Congress.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption ¹	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 short tons).....	100, 839	1, 044	99, 795	108	98, 828	Percent 0. 11
Value (million dollars).....	\$ 2, 017	24	\$ 1, 993	\$ 2. 2		
Unit value (short ton).....	\$20. 00	\$22. 56	\$19. 98	\$20. 34		
Persons employed.....	(4)					

¹ Stocks at the beginning and end of season have been considered in calculating consumption. Of this amount, 86,769,000 short tons were fed to animals and the rest used for human consumption, for industrial uses, and as seed.

² Farm value.

³ Foreign value.

⁴ See employment.

Except for wheat and rice, grains are used principally for feed. Corn, oats, barley, and grain sorghums are commonly grouped together as feed grains. In this section rye and buckwheat are also included because about 50 percent of these grains is fed to livestock. Separate sections have been prepared on wheat and rice.

Imported barley is used both for feed and for malting. The quantity used for malting depends upon the quality of the barley crop in the United States. Imported oats are also used for feed and for processing into rolled oats. Imports of the other feed grains are usually used entirely for feed.

In 1939, 88 percent of the feed grains was fed to livestock and the remaining 12 percent was used for human consumption, industrial purposes, and seed. The supply of feed grains tends to follow the trend of grain-consuming animal units rather closely, although the consumption of the feed grains depends not only upon the number of livestock and poultry but also upon the supply of the grains themselves. During 1926-33 the grain-consuming animal units¹ were relatively constant, ranging from a low of 135 million to 144 million units, with an average of 138.8 million units. Principally because of the drought, which reduced domestic supplies of feed during the years 1934-38, the average annual number of grain-consuming animal units dropped sharply to 122.8 million. In 1939, the number was 138.5 million, or about equal to the average of 1926-33. During 1926-33, the annual supply of feed grains amounted to 109.3 million tons, compared with 92.7 million tons in 1934-38. In 1939, the supply totaled 115 million tons. In 1926-33 the carry-over of the feed grains was about 10 million tons compared with about 20 million in 1938 and 1939. In 1939 the disappearance of feed grains amounted to 0.69 ton per grain-consuming animal unit, compared with 0.695 for an average, 1926-38. The year 1939, therefore, may be considered as representative of the consumption of feed grains and the number of grain-consuming animal units (see table below).

Feed grains: United States production, trade, and consumption, 1939

Grain	Production	Exports	Imports	Consumption		Ratio (in percent) of imports to consumption	
				Total ¹	Fed	Total	Fed
Quantity (1,000 short tons)							
Corn.....	72,266	899	14	69,357	62,421	0.02	0.02
Oats.....	15,323	4	69	16,232	14,161	.42	.49
Barley.....	6,676	130	19	6,659	4,389	.28	.43
Wheat.....	3,845	(²)	46	3,871	3,871	.15	.15
Grain sorghums.....	1,491	(³)	.....	1,491	1,407	.....	.....
Rye.....	1,080	3	(⁴)	1,080	449	.....	.....
Buckwheat.....	138	8	(⁵)	138	71	.....	.....
Total.....	100,839	1,044	108	98,828	86,769	.11	.12
Value (1,000 dollars)							
	<i>Farm value</i>						
Corn.....	1,476,300	19,802	268	1,404,479	1,264,025	.....	.....
Oats.....	290,922	108	1,526	315,712	275,431	.....	.....
Barley.....	110,826	3,345	334	111,871	73,735	.....	.....
Wheat.....	89,088	(²)	449	89,227	89,227	.....	.....
Grain sorghums.....	29,120	2	.....	30,113	28,421	.....	.....
Rye.....	17,163	70	(⁴)	16,956	7,049	.....	.....
Buckwheat.....	3,560	229	(⁵)	3,609	1,857	.....	.....
Total.....	2,016,979	23,556	2,197	1,971,972	1,739,745	.....	.....

¹ Stocks at the beginning and end of season have been considered in calculating total consumption.

² Quantity of domestic wheat fed to livestock.

³ There were no exports of feed wheat.

⁴ Wheat unfit for human consumption.

⁵ Less than 500.

¹ The following factors were used to determine the number of grain-consuming animal units: milk cows, 1.00; other cattle, 0.51; hogs, 0.87; sheep, 0.04; horses and mules, 1.14; and chickens, 0.045.

Corn, representing 75 percent of the feed grains, is by far the most important, followed by oats, which represents about 16 percent of the feed grains.

The United States is normally on a substantial export basis with respect to feed grains. The customarily small imports enter in response to the demand of certain localities where, particularly in a given season, the supply may be inadequate because of a small crop or an unusually large number of animal units to be fed.

The foreign trade in these grains is induced by considerations similar to those which give rise to trade between surplus and deficit areas within the United States and is usually small in comparison with this domestic trade. During periods of short domestic crops, notably the years of severe droughts, 1934-36, imports increased, but the increase is usually very small in relation to the decrease in domestic production, so that the number of animals and poultry is also decreased. In 1929-33, before the severe droughts in the United States, the annual exports of feed grains averaged 757,000 tons, compared with 1,044,000 tons in 1939. Annual imports averaged 72,000 tons in 1929-33 and 108,000 tons in 1939.

With the exception of corn, Canada is the principal source of imports of the feed grains. Although Argentina is the largest potential source of imports of corn, and has been the principal source in years of unusually short United States crops, in years of a normal domestic corn crop Cuba and the Dominican Republic have been the principal sources of imports. In both 1938 and 1939 more than 75 percent of imports of corn entered the customs district of Puerto Rico.

POST-WAR SHORT TERM

Consumption of the feed grains in the post-war short term probably will be somewhat below the wartime peak of 134.0 million tons but considerably greater than the 98.8 million tons in 1939. Imports seem likely to supply about the same percent of consumption as in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Under any of the levels of income or duty discussed below domestic production of feed grains will probably, as it has in the past, exceed consumption by approximately 1 percent; even though consumption with a per capita income 75 percent higher than in 1939 would be substantially greater than in 1939, it would probably not exceed the peak attained during World War II.

Per capita income at 1939 level.

The long-term average disappearance of feed grains will vary with the number of grain-consuming animal units, which, under the conditions assumed here, are likely to exceed the number in 1939 in approximately direct proportion to the anticipated increase in population. It seems likely, therefore, that consumption would average about 10 percent higher than in 1939, or about 110 million tons. The part of the total consumption of these grains used for purposes other than feed would probably increase in like proportion.

Production of all feed grains for the domestic market would probably be about 109.9 million tons and, at prices about the same as in 1939, would have a value of 2,198 million dollars. The production

of barley and grain sorghums seems likely to increase and may offset a possible decrease in corn and oats.

With normal crops in the United States, imports seem likely to remain relatively small under the various changes in duty, and, consequently, average prices and production in the United States would not markedly be affected. However, the percentage change in imports with a change in duty might be large. Imports will compete with domestic supplies for the deficit-producing areas in the Northeast, on the Atlantic and Pacific coasts, and in Puerto Rico.

Duties as in 1939.—It seems likely that imports will increase at about the same rate as population and probably will amount to about 120,000 tons, or about 0.1 percent of consumption, with a foreign value of 2.4 million dollars.

Duties decreased by 50 percent.—Under this assumption imports of corn from Argentina would probably compete on a more favorable basis with domestic supplies shipped to the Pacific and Atlantic coasts, and would be substantially larger than those of 1939. Imports of oats and barley from Canada would probably increase considerably, although relatively less than the imports of corn, and enter the Northeastern United States. Total imports may total, say, 275,000 tons, or about 0.3 percent of consumption. With a somewhat higher average foreign unit value, the total imports would have a foreign value of about 6 million dollars.

Duties increased by 50 percent.—Imports would be greatly restricted. Imports of corn would probably be limited to entries in Puerto Rico, and of barley to that for malting purposes only, and of oats to that processed into human food. Total imports seem likely to be about 40,000 tons, or about 0.04 percent of consumption. With the foreign prices somewhat below those of 1939, the foreign value might be about 0.8 million dollars.

Per capita income 75 percent higher than in 1939.

In view of a probable increase in the number of livestock and poultry of about 20 percent over 1939, and the further probability that grain would be fed in about the same proportion as in 1939, total consumption of feed grains might be around 120 million tons. Production for the domestic market seems likely to be somewhat more than 119.8 million tons. Production of all feed grains may increase about 20 percent; the increase for barley and grain sorghums may exceed, and that for corn and oats may be slightly under, 20 percent. With prices of agricultural products generally, and meat products in particular, considerably above those in 1939, the value of domestic production might be 3,500 million dollars. Neither consumption nor production would probably be affected greatly by the several assumed rates of duty, but the imports might be changed considerably. Under none of the assumptions below, however, would imports be likely to be as much as 0.5 percent of consumption.

Duties as in 1939.—Total imports would probably amount to about 131,000 tons, or about 0.11 percent of total consumption. With foreign prices increased in the same proportion as domestic prices, the foreign value might be about 4 million dollars.

Duties reduced by 50 percent.—As at the lower income level, imports of corn would probably increase relatively more than the other feed grains under a reduction in duty. Total imports of all feed grains

might be about 400,000 tons, or about 0.3 percent of consumption, with a foreign value of about 12 million dollars.

Duties increased 50 percent.—Again as under the lower-income level, imports would be much smaller if the duty were 50 percent higher than in 1939. Total imports might be about 50,000 tons, or about 0.05 percent of consumption, with a foreign value of 1.5 million dollars.

Exports

Exports in 1939 amounted to 1 million tons and were about normal. Corn was the most important of the exports of feed grains, amounting to about 85 percent of the total, and barley was next, amounting to about 12 percent. Most of the exports of all grains go to Canada and European countries. Post-war exports in the long term seem likely to be about the same as in 1939 at the assumed lower level of income and somewhat higher at the assumed higher level of income and at the assumed reduced rate of duty. In addition to the exports in the form of grain, there would be considerable exports of corn in the form of pork products.

Employment

The United States Department of Agriculture estimates that the number of man-hours required per acre of the various feed grains are as follows: Corn, 27.3; oats, 9.0; barley, 9.6; grain sorghums, 12.1; rye, 9.9; buckwheat, 19.8; and wheat, 8.7. On this basis, in 1939, the equivalent of 1,255,000 full-time persons on a year-round basis were required for farm production of the feed grains.

Under the higher income level in the post-war long term, employment may be somewhat greater than in 1939.

MACARONI, VERMICELLI, NOODLES, AND SIMILAR ALIMENTARY PASTES, CONTAINING NO EGGS OR EGG PRODUCTS

Tariff paragraph: 725.

Commodity: Macaroni, vermicelli, noodles, and similar alimentary pastes containing no eggs or egg products.

Rate of duty: 2¢ per lb.

Equivalent ad valorem (1939): 21%

NOTE.—The rate shown above is that fixed in the Tariff Act of 1930. It was reduced to 1½ cents, effective November 15, 1941, pursuant to Trade agreement with Argentina, with reservation of the right to withdraw or modify the reduction after termination of the war with Germany.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	582,789	4,423	578,366	1,057	577,309	Percent 0.18
Value (\$1,000).....	35,812	207	35,605	1100		
Unit value (cents per pound).....	6.1	6.9	6.1	9.5		
Persons employed (number).....	5,412					

¹ Foreign value.

Macaroni, vermicelli, noodles, and similar alimentary pastes are made chiefly from semolina obtained from milling durum wheat. This report is limited to the alimentary pastes which contain no eggs or egg products. Both types of pastes, however, are made in the same plant. During the 1930's about 90 percent of the total quantity of all alimentary pastes contained no egg or egg products. Total production of these products has increased steadily since 1930. In 1931 production totaled 478 million pounds, compared with 536 million pounds in 1935 and 564 million pounds in 1937. Per capita consumption was about 3.9 pounds in 1931 but has remained at about 4.4 pounds during 1935-39. Imports have gradually decreased from an average of 1.9 million pounds in 1931-34 to little over 1 million pounds in 1939 and have consisted mainly of specialty products. About 50 percent of imports came from Italy and the remainder mostly from China, Hong Kong, and Japan. Consumption, production, and imports in 1939 may be considered as representative.

POST-WAR SHORT TERM

Consumption of these products may be about 5 percent higher than in 1939. Imports will probably be unimportant.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption is likely to be about the same per capita as in 1939 and amount in total to about 635 million pounds, and would not be markedly affected by the assumed changes in duty. Total production will probably exceed consumption and may amount to about 640 million pounds. Production for the domestic market may be about 634 million pounds, valued at about 40 million dollars.

Duty as in 1939.—Imports, which were declining before the war, seem likely to supply a somewhat smaller percentage of total consumption than they did in 1939 and may amount to about 1 million pounds, with a foreign value of around \$95,000.

Duty reduced by 50 percent.—Because of their special type, imports may be only moderately greater with a lower duty and may amount to about 1.3 million pounds, or about 0.2 percent of consumption, with a foreign value of \$125,000.

Duty increased by 50 percent.—Imports seem likely to be about 25 percent less than under no change of duty and amount to about 750,000 pounds, with a foreign value of about \$72,000.

Per capita income 75 percent higher than in 1939.

Under a high per capita income the quantity of these products consumed would probably be greater than at a low level of income and might amount to about 672 million pounds. The United States seems likely to continue on an export basis. Thus total production will be somewhat larger than consumption, or about 680 million pounds. Production for the domestic market might be about 670 million pounds and, at prices considerably above those in 1939, might be valued at 55 million dollars. Imports, being higher priced specialties, might be expected to increase relatively more than total consumption unless the duty is increased.

Duty as in 1939.—Imports might supply somewhat over 0.2 percent of consumption, or about 1.5 million pounds, with a foreign value of about \$180,000.

Duty reduced by 50 percent.—Imports might amount to 2 million pounds, or about 0.3 percent of consumption, with a foreign value of about \$250,000.

Duty increased by 50 percent.—Imports seem likely to be about 0.15 percent of consumption, or 1 million pounds, valued at \$115,000.

Exports

Although official statistics of exports do not distinguish between the two types of pastes, it is believed that the bulk of exports contain no eggs or egg products. The United States has been for many years on an export basis with regard to macaroni, vermicelli, noodles, and similar alimentary pastes. United States exports have gone principally to Canada, the United Kingdom, Mexico, and Panama, and will probably continue to be greater than imports but only a small part of domestic production.

Employment

There are a few more than 300 establishments in the United States producing macaroni, etc., which in 1939 had a total employment of 6,013 persons. About 25 percent of the establishments are in New York and about 15 percent in California. Inasmuch as about 90 percent of total production of all products in this industry consists of products containing no eggs or egg products, it is estimated that approximately 5,400 persons were employed in that branch. At the 1939 level of income in the post-war period about 5,950 persons may be employed; at the higher income level, 6,300 persons.

RICE

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
727	Paddy or rough rice.....	1½¢ per lb.....	No imports in 1939.
	Brown rice (hulls removed, all or in part).	1½¢ per lb.....	45.1%.
	Milled rice (bran removed, all or in part).	2½¢ per lb.....	86.7%.
	Broken rice, which will pass readily through a metal sieve perforated with round holes five and one-half sixty-fourths of an inch in diameter.	½¢ per lb.....	23.9%.
1752	Rice meal, flour, polished, and bran.	½¢ per lb.....	21.5%.
	Patna rice cleaned for use in the manufacture of canned soup.	Free.....	-----
	Average.....		33.1%.

NOTE.—The rate fixed in the Tariff Act of 1930 for broken rice, ½ cent per pound, was reduced to ¼ cent, effective February 1, 1936, pursuant to the trade agreement with the Netherlands.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1,488,302	303,111	1,185,191	70,310	1,255,501	Percent 5.6
Value (\$1,000).....	39,615	9,187	30,428	1,232		
Unit value (cents per pound).....	2.7	3.0	2.6	1.6		
Persons employed ¹						

¹ Quantity of milled rice produced—value at mill.

² Foreign value.

³ 9,626 farms reported production of rice, 72 mills reported 3,218 persons employed.

With the exception of rough or paddy rice used for seed and small quantities fed to livestock, rough rice as it comes from the threshing machine or combine is processed into brown (uncleaned) and milled rice (cleaned or polished rice). In processing rough rice the hulls are removed, thus leaving a product called brown rice.¹ In 1939 only one-half of 1 percent of total production of processed rice was consumed as food in form of brown rice. In further processing the brown rice, the germ and bran layers are removed as byproducts. In the process of milling many kernels are broken and several grades of milled rice result as follows: Head rice is that which consists mostly of whole kernels; second head comprises the largest pieces of broken kernels; screenings, the next smaller pieces; and brewers' rice, the smallest pieces of broken kernels. Of the total production of milled rice in 1937-39, 82 percent was head rice, second heads about 5 percent, screenings about 7 percent, and brewers' rice about 6 percent. Rice meal and flour are ground from milled rice. Normally, the price varies with the variety of rice and the size and proportion of broken kernels—the long-grain varieties and the head rice command the highest price and the short grain and broken rice the lowest. Note that the several grades mentioned above are all "milled rice" as used in the trade; but in the import statistics quoted below, "broken rice" is used to cover that part of screenings and brewers' rice which will pass readily through a metal sieve perforated with round holes five and one-half sixty-fourths of 1 inch in diameter, and "milled rice" means only the whole kernels and second heads, usually served as food in this country.

Patna rice is a variety produced largely in British India. Its kernels remain intact even when used in soup. It commands a price premium, and has been admitted free for use in canned soups, as not directly competitive with domestic production. Imports of Patna rice for use in the manufacture of canned soups (free for such use) seem likely to be little affected by the changes in duties on other classes of rice. However, imports might be affected by increased United States production of varieties similar to Patna rice.

¹ In milling rice, 100 pounds of rough rice yield from 57 to 64 pounds of milled rice. Conversion in this report has been made at 100 pounds of milled rice as equivalent to 162 pounds of rough rice or 128 pounds of brown rice.

The per capita consumption (includes consumption in Puerto Rico, Hawaii, and Alaska) of milled rice has increased from 8.0 pounds annually in 1930-34 to 9.4 pounds in 1935-39, and was 9.6 pounds in 1939. In 1935-39 the per capita consumption of rice in Hawaii was over 200 pounds and in Puerto Rico, 128 pounds. From 25 to 30 percent of total United States consumption is in Puerto Rico and Hawaii.

In 1925-31 annual production averaged about 1,250 million pounds, declined to 1,182 million pounds in 1935, increased to 1,305 million pounds in 1937, and to 1,448 million pounds in 1939. The factory price per 100 pounds of head rice was \$2.85 in 1939 as compared with \$3.58 in 1937. The price per 100 pounds of brewers' rice was \$1.78 in 1939 as compared with \$2.36 in 1937. In 1943, Louisiana produced 33 percent of total rice; Texas, 28 percent; California, 20 percent; and Arkansas, 19 percent.

Exports were over 20 percent of domestic production in 1939, a large part of which went to the preferential market in Cuba. Exports may in the future be subject to competition from countries which have been rapidly increasing their production of rice.

Imports of the various classes of rice have fluctuated widely. In 1925-29, imports of milled rice were predominant, amounting to 40 percent in quantity and to 60 percent in value of total imports of all classes of rice. In 1935-39 imports of broken rice have been predominant. In 1939, broken rice amounted to 75 percent in quantity and to 57 percent in value of total imports of all classes of rice. The following data show detailed United States imports of rice for 1939:

Kind of rice	Quantity	Total value	Value per pound
	1,000 pounds	1,000 dollars	Cents
Rough (paddy).....			
Brown.....	3,796	126	3.33
Milled.....	7,664	218	2.81
Patna for soup.....	4,615	145	3.15
Rice flour, meal, and bran.....	1,502	44	2.91
Broken rice ¹	53,516	699	1.31

¹ Broken rice which will pass readily through a metal sieve perforated with round holes five and one-half sixty-fourths of 1 inch in diameter.

The principal source of supply varies with the class of rice. In 1939, Japan was the principal source of brown rice, China of milled rice, British India of Patna, Netherlands of rice meal, flour, and bran, and Belgium and the Netherlands (about equal in importance) of broken rice. During 1936-39, the large imports of broken rice were used by the brewing industry.

POST-WAR SHORT TERM

Because the trend of per capita consumption of milled rice has been upward in the 1930's, it seems likely that it will be slightly higher in the short term than in 1939, or about 10 pounds per capita. Imports seem likely to supply about the same proportion of consumption as in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The per capita consumption of rice in the post-war long term seems likely to be slightly higher than in 1939, or about 10 pounds per capita.

Assuming 10 percent increase in population, total consumption in the long term would probably be about 1,450 million pounds. Consumption is not likely to be affected materially by change in duty. Domestic production would probably exceed consumption approximately by the amount of net exports, or about 220 million pounds. Thus, if proportionately large exports can be maintained, production might amount to about 1,670 million pounds, with a value of about 45 million dollars, regardless of assumed changes in duty.

Duties as in 1939.—Total imports might supply about the same percent of consumption as in 1939, or about 80 million pounds, about 5.5 percent of consumption, with a foreign value of about 1.4 million dollars.

Duties reduced by 50 percent.—A reduction of 50 percent in rates of duty would have different effects on the various classes of imports. Imports of milled rice (subject to 2½ cents per pound duty equivalent to nearly 90 percent ad valorem in 1939) might increase from 7.7 million pounds in 1939 to 15 to 20 million pounds, but even so would represent only a small increase in the total supply. Imports of broken rice (½ cent per pound duty or 24 percent ad valorem in 1939) would probably be little affected by the reduction. Total imports might be about 90 million pounds, or about 6.2 percent of domestic consumption, and because the unit value of milled rice is higher than that of broken rice, the foreign value might be about 1.8 million dollars.

Duties increased by 50 percent.—It seems likely that a higher duty would have little effect on the low-duty classes, but to increase the rate on milled rice to 3¾ cents would probably reduce imports of milled rice by at least 50 percent. Total imports might be about 70 million pounds or about 4.8 percent of consumption, with a foreign value of 1.3 million dollars.

Per capita income 75 percent higher than in 1939.

With the increase in per capita income, it seems likely that the per capita consumption of rice will be about 12 pounds. Prices will probably increase about 15 percent because of the higher income. Total consumption seems likely to be about 1,800 million pounds. Domestic production—assuming that exports can be similarly increased—seems likely to amount to about 2,050 million pounds valued at 65 to 70 million dollars. Production is likely to be more affected by changes in quantities of exports than by changes in duty.

Duties as in 1939.—With the rates of duty the same as in 1939, imports may be expected to supply about 5.5 percent of total consumption, or about 100 million pounds, with a foreign value of about 2 million dollars.

Duties decreased by 50 percent.—A reduction of 50 percent would probably have little effect on imports of broken rice, but the combination of increase in prices and a reduction in duty of milled rice to

1.25 cents per pound might stimulate imports to about 35 million pounds, with a foreign value of about 1.7 million dollars (similar to the quantity of imports of milled rice in 1925-29). Total imports of all classes seem likely to be about 112 million pounds, or about 6.2 percent of consumption, with a foreign value of 3.2 million dollars.

Duties increased by 50 percent.—A duty of \$3.75 per 100 pounds on milled rice and \$2.25 on brown would probably decrease imports of these classes from 50 to 75 percent but a higher rate might have little effect on imports of broken rice. Total imports might be about 86 million pounds, that is, about 4.8 percent of consumption, with a foreign value of 1.5 million dollars.

Exports

In 1937-39, exports of rice amounted to about 8 million dollars annually, of which 95 percent was milled rice, 4 percent rough rice, and 1 percent rice screenings, broken rice, rice flour, and meal. About 70 percent of total exports of milled rice (includes second heads or larger pieces of broken kernels) went to Cuba, and a large part of the remainder to European countries; about 50 percent of total exports of rough rice went to Canada. It seems likely that exports will continue to exceed imports, and that they will probably total 300-350 million pounds, valued at 9-10 million dollars annually. Because of the increase in exports of rice from Latin-American countries, United States exports of rice will probably have more competition in foreign markets.

Employment

The United States Department of Agriculture estimates that 32 man-hours are required to produce an acre of rice. On this basis in 1939, 14,000 man-years were required to produce the rice crop. In the post-war long term the labor requirements seem likely to increase in the same proportion as production, and would be about 16,500 man-years at the lower level of income and about 19,700 man-years at the higher level. In the Census of 1939, 72 rice mills reported production of milled rice with 3,218 persons employed. In the long-term post-war period, the number of persons employed in the rice mills seems likely to increase by about the same proportion as production and would probably amount to about 3,800 at the lower level of income and to about 4,500 at the higher.

WHEAT

Tariff paragraph: 729.

Commodity: Wheat.

Rate of duty: 42¢ per bu. of 60 lb.

Equivalent ad valorem (1939): 37%.

NOTE.—Imports of wheat were placed under a quota regime on May 29, 1941 (see text), which remains in effect with modifications. Since April 29, 1943, imports of wheat made under the authority of the War Food Administrator have been exempted from the quota. From December 23, 1943, to June 19, 1944, wheat to be used for feed for livestock entered duty-free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption ¹	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 bushels) (60 pounds bushel).....	741,189	63,214	677,966	19	657,462	Percent 0.003
Value (\$1,000).....	\$512,401	\$6,815	\$478,586	\$21		
Unit value (per bushel).....	\$0.69	\$0.58	\$0.70	\$1.10		
Persons employed.....	(²)					

¹ Stocks at the beginning and end of the year have been considered in estimating apparent consumption. The figure includes consumption by the farmer of wheat harvested on his own farm.

² Does not include wheat unfit for human consumption.

³ Farm value.

⁴ Foreign value.

⁵ See section on employment

United States imports of wheat are classified into three groups: (1) wheat fit for human consumption, dutiable at 42 cents per bushel; (2) wheat unfit for human consumption, dutiable at 5 percent ad valorem; and (3) wheat imported free, for milling in bond and export as flour. This report relates only to wheat fit for human consumption. Imports unfit for human consumption are included in the section on feed grains.

Normally, only hard spring wheat of the highest quality with a relatively high price is imported for milling. In 1928-39 annual imports, practically all from Canada, under the duty of 42 cents per bushel, averaged only about 25,000 bushels, with a foreign value of \$20,000, except for the drought years 1934-37, when annual imports averaged 15.5 million bushels, with a foreign value of 14.8 million dollars.

Since 1933, the wheat crop has been subjected to various control programs administered under the Agricultural Adjustment Act. Under section 22 of that Act, as amended, quotas were established for wheat, by Presidential proclamation effective May 29, 1941, which limited annual imports of wheat other than for feed to 800,000 bushels; of this quota, 795,000 bushels were apportioned to Canada.

Since the quotas were established in 1941, Canada has filled its share each year because the price of wheat since 1941 has been much higher in the United States than in Canada owing to the United States wheat program. This price differential, in fact, had been the principal reason why the quota on wheat was put into effect.

In 1937-39, about 70 percent of total domestic consumption was for food and the remainder for feed, seed, and industrial uses. Total consumption per capita for all purposes averaged 5.2 bushels in these years as compared with 5.5 bushels in 1931-33. Annual production in 1928-32 averaged 865 million bushels, as compared with 584 million in the drought years 1933-36, and 845 million in 1937-39. Of the total wheat crop in the United States in 1937-39, about 43 percent was hard red winter, 26 percent soft red winter, 15 percent hard red spring, 12 percent white wheat, and 4 percent durum.

In the 1930's, several international wheat conferences were held by representatives of large wheat exporting and importing countries for the purpose of formulating plans to dispose of the unusually large stocks of wheat on hand in the exporting countries and, at the same time, to restrict production in those countries. The International Wheat Agreement (1942), which may be called an interim agreement, was intended to be in effect until about two years after the war. Under the agreement, the signatory countries agreed to help to provide an international pool of wheat to aid the war-stricken areas; to adopt some measures to control production with the object of minimizing the accumulation of excessive stocks of wheat; and to establish an administrative body. This body was organized in August 1942 under the name of the International Wheat Council. Although the 1942 agreement did not provide a price section, the Council was empowered at any time to include a price provision in the memorandum. Since that time, the Council has had several informal discussions with the view to stabilizing the post-war wheat market by setting up basic minimum and maximum prices for wheat sold in world markets. The effect of any future agreement upon post-war trade is largely dependent upon the number and importance of countries collaborating with the Council.

Although the yield per acre of wheat was about average in 1939, total production was somewhat less because of the reduction of acreage under the Government wheat program. Because of the increasing stocks of wheat at the end of the crop year, prices of wheat were low.

For the purposes of this section it is assumed that the present quotas will remain in effect. If the quotas should be reduced, imports, of course, would be lessened accordingly. If the quotas were removed and the duty reduced by 50 percent, imports might rise materially. If the quota should be removed, with the duty unchanged, imports might remain below the quota level, or rise above it, depending on the price-control policies of the United States and Canadian Governments.

POST-WAR SHORT TERM

Total consumption and production in the post-war short-term period seem likely to be somewhat below the war-time peak but will probably be about 10 to 15 percent above 1939. Imports are likely to continue at the quota limit.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The per capita consumption of wheat may continue the downward trend as indicated in the 1930's and may be about 5 bushels. Total consumption may be about 725 million bushels. The price of wheat was low in 1939. Production for the domestic market would probably total 725 million bushels, valued at 650 million dollars.

Duty as in 1939.—Imports cannot be predicted as they depend on the price-control policies of the United States and Canadian Govern-

ments, and might range from a few thousand bushels to the full amount of the quota, with a foreign value of \$10,000 to \$880,000.

Duty reduced by 50 percent.—A decrease in duty to 21 cents per bushel would probably cause imports to fill the quota of 800,000 bushels, with a foreign value of about \$880,000. Imports would probably amount to 0.11 percent of consumption.

Duty increased by 50 percent.—With an increase in duty to 63 cents per bushel, imports of wheat probably would be sharply reduced, assuming normal crops, and would probably be very small.

Per capita income 75 percent higher than in 1939.

With a higher income, there is generally a wider variety of foods consumed and therefore no increase in the consumption of wheat is indicated. Consumption would thus remain at about 725 million bushels. The ratio of imports to consumption would probably be the same under the various assumed rates of duty as under the lower income. Prices, however, would be different because of the higher income. The domestic price might be about \$1.10 per bushel and production for the domestic market valued at about 798 million dollars.

Duty as in 1939.—Imports might be no more than a few thousand bushels, with a foreign value of \$10,000, up to the full quota with a foreign value of \$960,000.

Duty reduced by 50 percent.—Imports would probably supply the full quota, if one were fixed at about present levels, and might have a foreign value of about \$960,000.

Duty increased by 50 percent.—With normal domestic crops there would probably be small imports at this rate of duty.

Exports

In 1929–32 annual exports of wheat amounted to 78 million bushels as compared with only 6.8 million bushels during the drought period 1933–36. In 1938 exports amounted to 87 million bushels. In 1938 and 1939 a large part of the exports were sold with the assistance of payments through the wheat export program. In 1937–39 the principal foreign markets were the United Kingdom, Belgium, and the Netherlands.

In the post-war long term at the lower income level, exports would probably be about 50 million bushels, valued at 45 million dollars, and at the higher income level, about 100 million bushels, valued at 110 million dollars.

Employment

The United States Department of Agriculture estimates that 8.7 man-hours are required to produce an acre of wheat. On this basis the employment of 191,000 full-time persons on a year-round basis were required to produce the wheat crop in 1939. In the post-war period the equivalent of about 210,000 persons at the 1939 level of income and of about 200,000 persons at the higher income level might be employed full time in the production of wheat.

BYPRODUCT FEEDS

Tariff paragraph: 708 (b), 730, 731, and 1780.

Commodity: Byproduct feeds: Mill byproducts, oil cake and meal, and animal proteins.

Rate of duty: Free to 1½¢ per lb.

Equivalent ad valorem (1939): 4.8%

NOTE.—Tariff history since 1930 is as follows:

Commodity	Tariff rate under act of 1930	Trade agreement rate, 1939	Equivalent, ad valorem 1939
Bran, shorts, byproduct feeds obtained in milling wheat or other cereals, and screenings, scalplings, chaff or scourings of wheat, flaxseed, or other grains or seeds.....	10%.....	5% ¹	Percent 5.0
Grain hulls.....	10¢ per 100 lb.....	5¢ per 100 lb. ¹	11.8
Oil cake and meal.....	2½¢ per lb.....	(2).....	21.0-38.0
Malt sprouts and brewers' grain.....	\$5 per long ton.....	\$2.50 per long ton ¹	10.4
Dried beet pulp.....	do.....	\$3.75 per long ton ¹	17.4
Dried buttermilk.....	3¢ per lb.....	1½¢ per lb.....	24.6
Tankage and fish meal.....	Free.....		

¹ Effective January 1, 1939, pursuant to trade agreement with Canada.

² Pursuant to trade agreement with Mexico effective January 30, 1943, soybean, coconut or copra, and cottonseed-oil cake and meal were reduced to ½¢ per lb., with reservation of right to withdraw or modify the reduction after the termination of the emergency.

During the period December 23, 1943, to June 19, 1944, these feeds, except certain types of screenings, oil cake and meal other than cottonseed and linseed, dried beet pulp, and dried buttermilk, were admitted free of duty under Public Laws 211 and 272 of the 78th Congress if used for feeding livestock.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption		Ratio of imports to consumption	
	Total	For export	For domestic market		Total ¹	Fed to livestock	Total	Fed to livestock
Quantity (1,000 short tons).....	11,004	427	10,577	841	11,753	11,083	Percent 7.2	Percent 7.6
Value (\$1,000).....	278,799	10,412	268,387	² 15,586				
Unit value (per ton).....	\$25.34	\$24.38	\$25.37	\$18.53				

¹ Stocks at the beginning and end of season have been considered in calculating consumption.

² Foreign value.

The byproduct feeds in this report have been divided into three groups—mill byproducts, oil cake and meal, and animal protein. Mill byproducts consist largely of feeds from processing grain for human food and for industrial purposes. This group also includes beet pulp and alfalfa meal. The oil cake and meal are the residue after the oil has been removed from the oilseeds. The animal proteins are largely the residue suitable for feed, of the meat packing, fish, and dairy industries.

Although the byproduct feeds amounted to only about 11 percent of total concentrates fed in 1939, they are necessary in supplying protein in livestock feed. In this group the mill byproducts are the

most important, followed in order by the oil cake and meal, and animal protein. The supply of these various byproducts is dependent upon the supply of, and the demand for, the primary products. In 1932-36 the average annual quantity of these products fed amounted to 9.2 million tons as compared with 10.7 million tons in 1937-39, and with 11.1 million tons in 1939. In 1943, they amounted to 15.5 million tons. Of the total consumption of these products over 90 percent is used for livestock feed.

Production, exports, imports, and consumption of the three groups of byproduct feeds in 1939 are shown in the following table:

Byproduct feeds: United States production, exports, imports, and consumption, by groups, 1939

Group	Production	Ex-ports	Im-ports	Apparent consumption		Ratio (percent) of imports to consumption	
				Total ¹	Fed to live-stock	Total	Fed to live-stock
Quantity (1,000 short tons)							
Mill byproducts.....	6,097	89	623	6,630	6,310	9.4	9.9
Oil cake and meal.....	3,797	338	189	3,894	3,663	2.3	2.5
Animal proteins.....	1,110	(²)	129	1,239	1,110	10.4	11.6
Total.....	11,004	427	841	11,753	11,083	7.2	7.6
Value (1,000 dollars)							
Mill byproducts.....	129,880	1,375	9,070	-----	-----	-----	-----
Oil cake and meal.....	95,969	9,021	1,786	-----	-----	-----	-----
Animal proteins.....	52,930	16	4,730	-----	-----	-----	-----
Total.....	278,799	10,412	15,586	-----	-----	-----	-----

¹ Stocks at the beginning and end of season have been considered in calculating consumption.

² Includes 54 thousand tons of copra cake and meal duty-free from the Philippines, and valued at nearly 1 million dollars.

³ Less than 500.

Source: Production, *Agricultural Statistics*; concentrates fed, U. S. Department of Agriculture, *Feed Situation*, June 1944, p. 23; imports and exports, official statistics, U. S. Department of Commerce.

Total imports of byproduct feeds usually exceed exports, principally because of the comparatively large imports of mill byproducts and animal proteins; with respect to oil cake and meal, this country is on a substantial export basis. Over 90 percent of the imports in 1939 were either free of duty or had a 5-percent ad valorem rate. Imports of mill byproducts, the principal item, consist mainly of bran, middlings, and screenings. They enter the northeastern United States from Canada. The ad valorem equivalent on oil cakes and meals, except those from the Philippines, ranged from 21 to 38 percent in 1939. In 1939, 60 percent of total imports of oil cake and meal was supplied by the Philippines and entered free of duty. Dutiable imports of oil cake and meal entered principally from China, Japan, Canada, and Mexico, and the average ad valorem equivalents of the duties are the highest on any of the byproduct feeds, ranging from 21 to 38 percent ad valorem in 1939. Of the animal protein, the bulk of the imports of tankage came from Argentina, Uruguay, and Brazil free of duty and entered the United States along the East Coast. Fish meal came principally from Japan and Canada, free of duty.

POST-WAR SHORT TERM

Consumption of the byproduct feeds in the short term would probably continue to be higher than in 1939 but somewhat lower than the wartime level of 15.5 million tons in 1943. Imports would probably supply a somewhat smaller proportion of consumption than in 1939, because those from Japan, China, and the Philippines would probably not have attained their former volume. Moreover, imports from the Philippines may be restricted by imposition of the full duty in accordance with the terms of the Philippine Independence Act.

POST-WAR LONG TERM

Consumption, Production, and Imports

The domestic demand for byproduct feeds is dependent upon the number of livestock and poultry to be fed and the supply of other feed concentrates. It seems probable that in the post-war long term the demand for protein feeds will be considerably larger than before the war, the degree of the increase depending upon the number of livestock and poultry, which in turn is influenced by the size of the national income. The proportion of consumption of feeds supplied by the byproducts under consideration will be substantially the same as in the past. The consumption of protein feed, may, however, increase to a somewhat smaller extent because of the progressive improvement in breeds of animals and the resulting greater efficiency in feeding.

In the estimates of the consumption, production, and imports of byproduct protein feeds given below, all the products are shown as a single unit. In arriving at the figures, however, consideration has been given to the probability of shifts in importance of the various products. With per capita income 75 percent higher than in 1939, it is estimated that the increase in domestic production of wheat mill feeds might be relatively smaller than the total because of a somewhat smaller increase in per capita consumption of wheat products; on the other hand, production of other mill byproducts may increase relatively more than the total. Imports of wheat mill feed, however, may be expected to supply about the same proportion of total consumption of feeds as in the past. Both domestic production and imports of animal proteins may increase in proportion to the number of animals fed. Domestic production of oil cake and meal, which even in 1939 exceeded consumption, is likely to increase relatively more than the domestic consumption of byproduct feeds. This increase is expected because of the large increase in the crushing of domestically produced oil-bearing seed (principally soybean and cottonseed) and the anticipated increase in imports of oil-bearing seed at the expense of the extracted oils (see section on fats and oils under schedule 1). Conversely, imports of oil cake and meal are likely to increase proportionally less than total consumption of byproduct feeds because there will probably be a large increase in domestic production and because of the possible change in duty-status of imports from the Philippines.

Per capita income at 1939 level.

Total consumption of byproduct feeds would probably be in the neighborhood of 10 percent higher than in 1939, or about 13 million tons. Wheat mill feeds would undoubtedly be the largest single class

and, because of the increased demand for soybean oil, soybean cake and meal seem likely to be the second most important byproduct feed. Production for the domestic market, as in 1939, would probably supply about 93 percent of consumption, or approximately 12.1 million tons. As prices may be about the same as in 1939, production may be valued at approximately 307 million dollars.

Because of the low rates or duty-free status of imported mill by-products and animal proteins, imports probably would be little affected by a 50 percent increase or decrease in the duties. Imports of oil cake and meal might be affected appreciably by either of such changes in duties. However, in view of the probable decline in relative importance of these imports, those that might enter would probably have little effect upon consumption and, being byproducts, virtually none upon production.

Duty as in 1939.—Imports would probably be about 910,000 tons, or about 7 percent of consumption, with a foreign value of nearly 17 million dollars.

Duty reduced by 50 percent.—It seems likely that imports of oil cake and meal would probably increase considerably, but total imports would increase only moderately and might be about 950,000 tons, or about 7.3 percent of consumption, with a foreign value of about 18 million dollars.

Duty increased by 50 percent.—Imports of oil cake and meal would probably be materially smaller and total imports would probably amount to about 850,000 tons, or about 6.5 percent of consumption, with a foreign value of about 15.3 million dollars.

Per capita income 75 percent higher than in 1939.

Under this assumption it seems likely that production of all the primary products from which these byproduct feeds are obtained, would increase about 20 percent over 1939, but that the increase in oil cake and meal and animal proteins may exceed 20 percent and that in mill byproducts may be somewhat under 20 percent. Total consumption may be about 14.0 million tons. Production for the domestic market would probably supply about 93 percent of consumption and be about 13.0 million tons. With the prices of agricultural products considerably above those in 1939 the value of production might be 480 million dollars. As under the lower level of per capita income, total imports would be affected moderately by the assumed changes of 50 percent in duty but would have little effect on consumption and virtually none on production.

Duty as in 1939.—Imports might supply about 990,000 tons, or 7 percent of consumption, with a foreign value of about 27 million dollars.

Duty reduced by 50 percent.—Imports of oilcake and meal would probably increase considerably, with the result that total imports might be about 1 million tons, or about 7.2 percent of consumption, with a foreign value of about 28 million dollars.

Duty increased by 50 percent.—Imports of oil cake and meal would probably be reduced considerably. Total imports seem likely to be about 950,000 tons, or about 6.7 percent of consumption, with a foreign value of about 25 million dollars.

Exports

Exports are practically limited to the two groups—mill byproducts and oil cake and meal. The principal item in exports of mill byproducts is mixed feeds, which goes to the United Kingdom, Canada, and to several Latin-American countries. The most important item in exports of oil cake and meal is linseed cake obtained from imported flaxseed and is exported with benefit of draw-back. Most of these exports go to Belgium and the Netherlands. Other exports of oil cake and meal go principally to Latin-American countries.

It seems likely that these exports would continue in the post-war long term at about the same proportion to production as in the pre-war period and range from 490,000 to 525,000 tons, valued at 12.4-19.4 million dollars.

Employment

As the items in this section are byproducts in manufacturing, separate statistics on employment in their production are not available.

CANNED DOG FOOD

Tariff paragraph: 730.

Commodity: Canned dog food containing grain products, and unfit for human consumption.

Rate of duty: 5% ad val.

NOTE.—The rate of duty originally imposed by the Tariff Act of 1930 was 10 percent ad valorem, which was reduced to 5 percent, effective January 1, 1939, pursuant to trade agreement with Canada.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	501,378	(¹)	501,378	4,802	506,180	<i>Percent</i>
Value (\$1,000).....	22,948		22,948	² 153		1
Unit value (cents per pound).....	4.6		4.6	3.2		
Persons employed (number).....	1,250					

¹ Negligible.

² Foreign value.

Commercial production of dog food began in the 1920's and increased rapidly in the early 1930's. The first official statistics of dog food were reported in the 1935 census, when the value of commercial production of all kinds totaled 19.7 million dollars. In 1937, domestic production amounted to 541.1 million pounds, valued at 27.7 million dollars increasing to 732.1 million pounds, valued at 33.5 million dollars in 1939. Of the total quantity of all dog foods commercially produced, canned dog food constituted 76 percent in 1937 and 68 percent in 1939, the remaining percent in each case consisting of dog biscuits, etc. The foregoing tabulation and the forecasts of this section refer only to canned dog food.

Production of canned dog food increased from 412.4 million pounds in 1937 to 501.4 million in 1939. Imports were not shown separately before 1939. Available information, however, indicates that exports of dog food from Argentina (the only source) to the United States amounted to 1.8 million pounds in 1937 and to 4.0 million pounds in 1938. United States exports are known to be small, although official statistics are not available.

POST-WAR SHORT TERM

The trend of consumption of canned dog food was upward in the pre-war period. It seems likely that consumption, imports, and production would probably be about 20 percent higher than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The upward trend in consumption of canned dog food seems likely to continue in the post-war long term, not only because of the increase in number of dogs but also because of convenience in feeding. Consumption may be about 40 percent higher than in 1939, or about 707 million pounds. Production would supply about 99 percent of consumption or about 700 million pounds, valued at about 32 million dollars. As the duty is only 5 percent ad valorem, 50 percent increase or decrease in the rate would have no marked effect on imports or consumption. Imports might range around 7 million pounds with a foreign value about \$225,000.

Per capita income 75 percent higher than in 1939.

With the higher per capita income, there would probably be more dogs and cats kept for pets, especially in towns and cities, where the consumption of prepared pet foods is the largest. Consumption might amount to about 60 percent above that of 1939 and be about 810 million pounds. Production seems likely to supply about 99 percent of consumption, or about 800 million pounds, valued at about 52 million dollars. A 50-percent increase or decrease in the low duty would have no marked effect on imports or consumption. Imports might range around 8 million pounds, with a foreign value around \$350,000.

Exports

In the immediate pre-war period, a few trial shipments of canned dog food were made to several countries. It seems likely that exports will remain relatively small in the post-war period.

Employment

Production statistics of canned dog food are included in the prepared feeds industry by the Bureau of the Census. In 1939, the value of production of canned dog food constituted 5.2 percent of total value of all production in the prepared-feeds industry. On this basis, 1,250 persons were employed in the production of canned dog food in 1939. At the 1939 level of income in the post-war period, it is estimated that about 1,750 persons would be employed and at the higher income level, about 2,000 persons.

BISCUITS, CRACKERS, WAFERS, PUDDINGS, CAKES, ETC.*Tariff paragraph:* 733.*Commodity:* Biscuits, crackers, wafers, puddings, cakes, etc.*Rate of duty:* 15% ad val.

NOTE.—The rate fixed by the Tariff Act of 1930 was 30 percent ad valorem, which was reduced to 15 percent, effective January 1, 1939, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	574, 444	1, 074	573, 370	1 286	573, 656	Percent 0. 05
Persons employed (number).....	3 77, 000					

1 Foreign value.

2 Estimated.

This statement covers all baked articles except bread and similar yeast-raised products, made from flour and other baking ingredients. The principal items in this group are crackers, biscuits, sponge goods, sweet goods, cookies, pretzels, soft cakes, pies, and pastries. The terms "biscuits" and "wafers" are customarily applied by consumers to unsweetened crackers and sweet cookies. Value of production showed a wide range in 1929-39, but principally because of the varying prices of the products. In 1929 production amounted to 619-million dollars, in 1933 it dropped to a low of 320 million, then increased to 553 million dollars in 1937, and to 574 million dollars in 1939. In 1927-30 average annual imports amounted to about \$669,000, compared with \$300,000 in 1931-34 and with \$320,000 in 1935-38. Imports consist mainly of biscuits and crackers and special types of cakes and puddings. The United Kingdom, the Netherlands, and Japan are the principal sources. Exports greatly exceed imports and consist mainly of biscuits and crackers. Consumption, production, imports and exports in 1939 may be considered as about normal.

POST-WAR SHORT TERM

Consumption of this group of baked articles would probably be about 30 percent higher than in 1939, and imports would supply about the same percent of consumption as in 1939.

POST-WAR LONG TERM**Consumption, Production, and Imports*****Per capita income at 1939 level.***

Consumption will probably be about 10 percent higher than in 1939 and amount to about 631 million dollars. Of this amount, production for the domestic market seems likely to supply all but a few hundred thousand dollars regardless of the assumed rate of duty.

Duty as in 1939.—Imports would probably be about 0.05 percent of consumption, or about \$316,000 (foreign value).

Duty reduced by 50 percent.—Because imports include specialty articles, a reduction to 7½ percent ad valorem seems likely to increase imports only by about 25 percent. Imports would probably amount to about \$395,000 (foreign value), or about 0.063 percent of consumption.

Duty increased by 50 percent.—An increase in duty to 22½ percent ad valorem would probably decrease imports by about 10 percent. Imports would probably amount to \$284,000 (foreign value), or about 0.045 percent of consumption.

Per capita income 75 percent higher than in 1939.

Consumption of this group of articles, especially the sweet goods, might increase considerably with a higher level of income and amount to about 883 million dollars, or about 40 percent higher than consumption in the long term at 1939 income levels. Of this amount, production for the domestic market would probably supply all but a few hundred thousand dollars regardless of the assumed rate of duty.

Duty as in 1939.—Imports would probably be about 0.05 percent of consumption, or \$442,000 (foreign value).

Duty reduced by 50 percent.—Imports might amount to about \$662,000 (foreign value), or about 0.075 percent of consumption.

Duty increased by 50 percent.—Imports would probably amount to about 0.045 percent of consumption, or about \$397,000 (foreign value).

Exports

Exports consist of biscuits and crackers of which about two-thirds are plain, and about one-third sweetened or flavored. Exports go mainly to Canada, Cuba, and South American countries. Total exports averaged 11.7 million pounds, valued at 2.1 million dollars in 1926–29, compared with 3.6 million pounds, valued at 0.6 million dollars in 1932–35, and with 5.3 million pounds, valued at 1.0 million dollars in 1936–39. In the post-war long-term period exports may be as high as 1 million dollars at the 1939 level of income and possibly larger at a higher rate of world income and with lower trade barriers.

Employment

Employment data are available for only a part of production. In 1939 the number of wage earners in the biscuit, cracker, and pretzel industry was 29,173. This industry produced about 38 percent of the total value of all articles in this group. On this basis about 77,000 wage earners were employed for the entire group in 1939. In the post-war long term, the number of wage earners would probably be about 85,000 at the 1939 level of income and about 95,000 at the higher income level.

BLUEBERRIES

Tariff paragraph: 736.

Commodity: Blueberries, natural and frozen.

Rate of duty: Natural, 1¢ per lb.; frozen, 17¼%. *Equivalent ad valorem (1939):* Natural, 19%.

NOTE.—The rates fixed in the Tariff Act of 1930 were 1¼ cents per pound on natural, and 35 percent ad valorem on frozen blueberries. The rate on frozen blueberries was reduced 25 percent pursuant to the first Canadian agreement, effective January 1, 1936, and further reduced to 17¼ percent pursuant to the second Canadian and the United Kingdom agreements, effective January 1, 1939. The rate on blueberries in their natural condition was reduced to 1 cent per pound pursuant to the second Canadian agreement.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	18,000		19,000	11,000	20,000	Percent 56
Value (\$1,000).....	1,006		500	612		
Unit value (cents per pound).....	5.5		5.5	5.5		
Persons employed.....	(?)					

¹ Fresh and frozen berries. Total production included an equal quantity that was canned.

² Foreign value.

³ 315,000 man-days.

In 1939, a representative pre-war year, total United States consumption of blueberries was 29 million pounds, of which 18 million were commercial domestic production and 11 million were imported. Domestic production had a value of about 1 million dollars, or an average of 5.5 cents per pound. About half of it was canned, and the remainder, about 9 million pounds, was sold in the fresh state; only a small percentage was frozen. Imports consisted almost entirely of fresh and frozen blueberries, imports of the canned having been unimportant. Thus total consumption of the fresh and frozen blueberries, which were sold in the same market, amounted to about 20 million pounds.

In 1931, imports of natural and frozen blueberries were of about equal importance and together totaled about 4 million pounds, but by 1939, 85 percent of the imports consisted of frozen berries, and 15 percent of the natural, and the total amounted to about 11 million pounds. The natural blueberries came from Canada; 70 percent of the frozen berries came from Newfoundland and 30 percent from Canada. During the war, with ocean shipping interrupted, imports from Newfoundland have been greatly reduced. Before the war, imports of frozen blueberries were increasing with slowly rising prices, but the period of importation was too short and the rise in imports too sharp for any relation in imports and consumer income to become clearly established.

POST-WAR SHORT TERM

During the war, the decrease in imports from Newfoundland has been offset to some extent by imports from Canada. Immediately after the war, as soon as shipping connections with Newfoundland have been restored, the trade with Newfoundland will probably be quickly revived as the berries grow wild and need only to be gathered and imports may attain the maximum of nearly 13 million pounds previously attained in 1940, when imports of frozen blueberries from Newfoundland were in the uptrend.

POST-WAR LONG TERM

Consumption, Production, and Imports

Heretofore the market for frozen blueberries has been limited largely to the great cities of the eastern seaboard but it may extend beyond that because of the growing popularity of frozen fruits in general and increased facilities for their distribution. Thus the upward trend in consumption, especially of the frozen blueberries, may be expected to continue after the war. As before the war, imports will probably continue to supply the greater part of the increase in consumption.

In regard to the effect of changes in the duty, recent reductions in duty probably only accelerated the sharp upward trend in imports of the frozen berries but were not able to reverse the downward trend in imports of the natural berries.¹ A 50-percent decrease or increase in the present rate of duty would probably not greatly affect the volume and value of either imports or production. However, the duty on frozen blueberries is ad valorem and that on the natural berries is specific, so if prices of blueberries should rise greatly, the ad valorem equivalent of the specific duty on natural blueberries would become much lower than the straight ad valorem rate on frozen blueberries and might cause some decrease in imports of the frozen blueberries and some increase in imports of the natural berries.

Per capita income at 1939 level.

Consumption might be as much as 35 percent greater than in 1939, or about 27 million pounds. In accordance with the pre-war trend, domestic production would be likely to supply a smaller, and imports a larger, proportion of the total. Imports might supply 60 percent, or about 16 million pounds, which at 1939 prices would have a foreign value of about 0.9 million dollars; and domestic production, about 11 million pounds, valued at about \$600,000.

Per capita income 75 percent higher than in 1939.

Consumption might rise as much as 65 percent above that in 1939, or to about 33 million pounds, of which about 20 million might be imported. With prices higher at about 6.5 cents per pound, imports would have a foreign value of approximately 1.3 million dollars; and domestic production might be expected to increase to 13 million pounds, valued at about \$800,000.

Exports

There are no exports.

Employment

In 1939, according to the census, blueberries were gathered or grown on a total of about 31,300 acres, of which about 80 percent were wild and 20 percent cultivated. At 80 man-hours per acre for the wild berries, and 126 man-hours for the cultivated, the result is a total of approximately 2.5 million man-hours, or 315,000 8-hour man-days. If domestic production should increase, employment might be expected to increase proportionately.

¹ Two recent reductions, January 1, 1936, and January 1, 1939, in the duty on frozen blueberries totaling 50 percent (from 35 to 17½ percent) were followed in each instance by larger imports, whereas a 20-percent reduction in the duty on the natural berries was followed by smaller imports.

FIGS, DRIED

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
740-----	Figs, fresh, dried, or in brine:		
	Valued at less than 7¢ per lb.-----	5¢ per lb.-----	110%
	Valued at 7¢ per lb. or more.-----	3¢ per lb.-----	30%
	Average-----		62%

NOTE.—Under the Tariff Act of 1930 figs, fresh, dried, or in brine, regardless of value, were dutiable at 5 cents per pound. The rate on figs valued at 7 cents per pound or more was reduced to 3 cents per pound, effective May 5, 1939, pursuant to the trade agreement with Turkey.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export ²	For domestic market			
Quantity (1,000 pounds)-----	42,400	800	41,600	4,350	45,950	Percent 9.5
Value (\$1,000)-----	1,993	41	1,950	296		
Unit value (cents per pound)-----	4.7	5.1	4.7	6.8		
Persons employed (number)-----	(³)					

¹ Total production was 52 million pounds, but only 42.4 million pounds were merchantable, and marketed as such; the remainder consisted of substandard figs. Throughout this report, production is taken as the quantity marketed through the regular merchandising channels.

² Estimated.

³ Foreign value.

⁴ See paragraph on employment.

In 1939, United States consumption of dried figs amounted to 46 million pounds, of which 90 percent were of domestic origin and 10 percent imported. The long-time trend in per capita consumption has been downward, having declined from 0.48 pound in 1921-25 to 0.36 pound in 1936-40.

Domestic production of merchantable dried figs ¹ increased from an average of 14 million pounds annually in the 1921-25 period to 40 million pounds in the 1936-40 period; in 1943, production was 60 million pounds. Despite the steadily increasing production, the acreage of bearing trees has been declining for many years and is expected to decline further. Prices have been declining—the farm price of the total crop declined from an average of 5.6 cents per pound in 1921-25 to a low of 2.1 cents in 1931-35, and increased to 3.6 cents in 1936-40. In 1943 the farm price was 14.1 cents per pound. Although the average price for the entire crop in 1939 was 3.9 cents, the merchantable part of the crop sold for 4.7 cents per pound.

Imports of dried figs declined from an annual average of about 38 million pounds in 1921-25 to about 5 million in 1936-40. The chief sources of imports before the war were Turkey and Greece. In 1939, after the trade agreement with Turkey, effective May 5 of that year, figs were entered under two price classes; about 60 percent were in

¹ Merchantable dried figs are that part of the crop which is marketed through normal trade channels (two-thirds sold for paste and one-third to the retail trade). The remainder consists of substandard figs which are diverted to the manufacture of byproducts such as cattle feed and alcohol. In the 1936-39 crop years, the unmerchantable figs were diverted with the help of Government subsidies. Only the merchantable part of the crop is considered in this report.

the class valued at less than 7 cents per pound and 40 percent in the class valued at 7 cents or more. Nearly all of the lower-priced figs came from Greece and nearly all of the higher-priced ones from Turkey. Average prices of imports remained fairly constant during the inter-war period at about 6.9 cents per pound; there was a slight rise in the period 1926-30 when the price averaged 7.5 cents per pound. In 1939, figs entering under the lower-priced bracket averaged 4.5 cents per pound, and those under the higher-priced bracket, 10 cents per pound.

POST-WAR SHORT TERM

Immediately after the war, consumption may be about as large as before the war, some increase in the population tending to offset any decline resulting from a continuance of the pre-war downward trend in per capita consumption. Domestic production will probably be larger than before the war, but as the acreage is declining it may not again attain its wartime peaks. Consumers will have become accustomed during the war to get along without imported figs; therefore, imports, which were already declining before the war, will probably be less than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

It is assumed that per capita consumption in the post-war period will be about the same as in the period 1936-40, that is, 0.36 pound. Although the yield per tree may be higher, the acreage in bearing trees will probably be lower and production of merchantable figs may average about 50 million pounds annually. Output will probably be affected somewhat by consumer income, but probably not much by changes in duty on the much reduced imports. Imports will probably not be as much affected by a 50-percent increase or decrease in the duty as formerly, when they entered in larger quantities. As they will serve mainly to satisfy a small class of consumers who prefer foreign brands of figs, any changes in the quantities imported are more likely to affect consumption than production.

Per capita income at 1939 level.

Production for the domestic market might supply about 50 million pounds, which at 4.7 cents per pound, would have a farm value of about 2.4 million dollars.

Duty as in 1939.—Consumption may total about 52 million pounds, of which imports may constitute about 4 percent. If imports amounted to about 2 million pounds, divided about equally between low-priced figs at 5 cents per pound and high-priced figs at 10 cents per pound, they would have a total foreign value of about \$150,000.

Duty reduced by 50 percent.—As imports would probably increase, consumption might increase correspondingly, or to about 53 million pounds. Imports would probably rise to about 3 million pounds, or to about 6 percent of consumption, with a foreign value of about \$200,000.

Duty increased by 50 percent.—Consumption would probably decline somewhat with imports, possibly to 51.5 million pounds, and imports to about 3 percent of consumption or to 1.5 million pounds, with a foreign value of about \$125,000.

Per capita income increased by 75 percent.

Production for the domestic market might supply about 54 million pounds which, with farm prices considerably higher than under the lower income, possibly at 6 cents per pound, would have a farm value of about 3.2 million dollars.

Duty as in 1939.—Consumption would probably not be increased very much over that under the lower income, but possibly by 10 percent, or to about 57 million pounds. Imports possibly amounting to about 3 million pounds or to about 5 percent of consumption, and perhaps equally divided between low-priced and high-priced figs at 6 and 12 cents per pound, respectively, would have a total value of \$270,000.

Duty reduced by 50 percent.—Imports would probably increase, and consumption might then amount to about 58 million pounds. Under the higher income, a reduction in the duty would probably affect imports of both the low-priced and high-priced figs, which might increase to about 4 million pounds, or to about 7 percent of consumption, with a total foreign value of about \$350,000.

Duty increased by 50 percent.—As imports would probably decline, consumption might decline correspondingly, or possibly to 56.5 million pounds, of which imports might contribute 4 percent. If imports declined to 2.5 million pounds, the foreign value might be about \$240,000.

Exports

The export market for figs has not been greatly developed and export statistics are not available. Pre-war exports were estimated at about 800,000 pounds, valued at about \$40,000. Most of the exports went to Canada. Owing to probable competition with figs from the Mediterranean countries, exports in the post-war period will probably not exceed pre-war exports substantially, but may increase 50 percent, or to about 1.2 million pounds, which under the higher income level might have a value of about \$75,000.

Employment

In 1939 there were 37,000 acres of bearing figs in California, 85 percent of which were in figs that were dried. The acreage in 1939 was distributed over about 5,000 farms, virtually all of which grew also other crops, principally grapes. By 1953, it is expected that only about 27,000 acres will be in bearing, with the same percentage for drying. In 1939, the acreage in drying figs, at 115 man-hours per acre per year, and assuming an 8-hour day and a 300-day year, required the employment of the equivalent of 2,030 persons fully employed all year. The acreage in 1953 would require the employment of the equivalent of 1,480 fully employed persons for one year.

DATES

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
741	Dates, fresh or dried:		
	With pits	1¢ per lb	30%
	Without pits	2¢ per lb	53%
	Average		44%

GENERAL

Data on United States production, imports, and consumption for 1939 and for the period 1936-40 are given below:

Item	Production			Imports ¹	Apparent consumption	Ratio of imports to consumption
	Total ¹	Exports ²	For domestic market ³			
1939						
Quantity (1,000 pounds).....	5,192	600	2,966	47,335	50,301	94
Value (\$1,000).....	327	39	193	1,577		
Unit value (cents per pound).....	6.3	6.5	6.5	3.3		
Employment.....	(⁴)					
Period 1936-40						
Quantity (1,000 pounds).....	7,970	700	5,517	52,051	57,568	90
Value (\$1,000).....	474	46	331	1,800		
Unit value (cents per pound).....	6.0	6.5	6.0	3.5		

¹ California production only, including dates diverted to byproducts.

² Estimated exports.

³ Marketable part of production only, less exports.

⁴ All imports converted to unsplit basis.

⁵ Foreign value.

⁶ 800 farms, 3,300 acres, and 108,900 man-days or 363 man-years of 300 working days a year.

⁷ Calculated price.

In 1939, total United States consumption of dates amounted to 50 million pounds, of which 47 million, or 94 percent, were imported dried dates, and 3 million, or 6 percent, were domestic fresh dates. Owing to the poor domestic crop and the small imports, 1939 was not representative of the pre-war period 1936-40, during which total average consumption was nearly 58 million pounds, 52 million of which, or 90 percent, were imported, and 5.5 million, or 10 percent, were of domestic origin. Before dates were first produced in California in the year 1920, consumption was supplied entirely by imports. During the interwar period, per capita consumption of imported dates remained virtually constant, irrespective of consumer income, at 0.4 pound, but total per capita consumption increased gradually with the increase in domestic production to 0.45 pound for the pre-war period 1936-40.

Domestic production increased from an average of 360,000 pounds annually in the 1921-25 period to about 8 million pounds in 1936-40, with a maximum for this period of 12.4 million pounds in 1940. Production amounted to 11.6 million pounds in 1941, 15.5 million in 1942, 21 million in 1943 (about 82 percent or 17.5 million pounds of which were of standard quality), and to 22 million pounds in 1944. The date is sensitive to unfavorable weather, and the crop of 1939 was only 5 million pounds compared with the 5-year average of 8 million pounds. In the 1936-40 period an average of about 25 percent of the crop was classed as substandard and was diverted with Government assistance to byproducts. In this report, only the part usually marketed through regular trade channels is taken into account. The farm price of domestic dates in the 1932-39 period averaged 4.5 cents per pound, with a range of 2 to 6.3 cents.

Imports increased gradually with the growth in population from 45.5 million pounds (unpitted basis) in 1921-25 to 52 million pounds in 1936-40. During the war, imports have almost ceased. Before 1928, all imports were with pits, but in 1928 dates with pits removed began to be imported and by 1940 constituted more than 60 percent of total imports. In recent years, there has been little fluctuation in the import price (foreign value); in the 8-year period 1932-39, unpitted dates averaged 3.4 cents per pound, and those with pits removed averaged 4 cents; in 1940, the price rose to 4.1 cents for the unpitted and to 4.3 for the pitted dates.

POST-WAR SHORT TERM

Assuming that per capita consumption of imported dates will remain about as before the war at 0.4 pound, but that average domestic production will continue to increase, total consumption might range from 60 to 70 million pounds. During the war, however, consumers have learned to do without imported dates and, therefore, imports may supply a smaller and production a larger percentage than before the war. Consumption may be about as follows: imports, 50-55 million pounds, and domestic production, 10-15 million pounds.

POST-WAR LONG TERM

Consumption, Production, and Imports

It is probable that by 1953 the domestic crop of dates will average about 20 million pounds annually, although part of the crop will be diverted to the manufacture of alcohol, cattle feed, and other products. To what extent the marketable part of the crop (75 to 85 percent) will replace imports is not predictable, but it is probable that it will replace them only to a slight extent, if at all, and that per capita consumption of the imported type will remain somewhere near what it was before the war, namely, 0.4 pound. The discussion of post-war probabilities which follows is based upon these assumptions.

In regard to changes in duty, it appears that a reduction of 50 percent would not greatly affect the volume of imports. An increase of 50 percent, however, which would result in a total duty of 1½ cents per pound on the unpitted and 3 cents on the pitted dates, might result in a greater proportion of imports of the unpitted dates at the expense of the pitted dates but would probably not reduce greatly the total volume of dates imported. The Tariff Act of 1930 increased the duty on pitted dates from 1 to 2 cents per pound and continued the duty on unpitted dates at 1 cent; nevertheless, the upward trend in imports of pitted dates continued at an accelerated rate, as it was cheaper to pay the higher duty than to have the pitting done in the United States.

Per capita income at 1939 level.

With consumption per capita at the same rate as before the war, consumption of imported dates might be about 55 million pounds, and consumption of domestic dates, which would depend upon the size of the marketable crop, might be about 17 million pounds, a total of 72 million pounds. The domestic commercially marketed output (including exports) at 6 cents per pound would have a farm value of approximately 1 million dollars; and imports, at a price of 4 cents per pound, would have a foreign value of approximately 2.2 million dollars.

Per capita income 75 percent higher than in 1939.

As consumption and imports of dates during the 1920's and 1930's were only slightly affected by changes in national income, and as domestic production is largely dependent upon the weather, production and imports would probably not differ materially from those under the lower income. Prices, however, would probably be higher; the domestic commercially marketed output, at possibly 8 cents per pound, would have a farm value of approximately 1.4 million dollars, and imports, possibly at 5 cents, probably have a total foreign value of 2.8 million dollars.

Exports

United States exports of dates consist of dates grown in California and repackaged imports from Iraq. In 1936 and 1937 exports averaged 700,000 pounds, valued at \$46,000; more recent statistics are not available, but in 1939, exports were probably somewhat smaller. As the exports go mostly to Canada, they are likely to increase as the Canadian consumer becomes accustomed to the California semidry date.

Employment

In 1939, date plantings in California covered 3,300 acres and were distributed among about 800 farms; there is also a small acreage in Arizona. The industry employs considerable extra-seasonal labor. The labor per acre is estimated at 33 man-days annually, or a grand total of about 108,900 man-days for 1939, equal to 363 man-years of 300 working days, and about the same number for the post-war long term, as the acreage is not expected to increase appreciably.

GRAPES

Tariff paragraph: 742.

Commodity: Grapes, other than hot-house, and hothouse grapes.

Rate of duty: 25¢ per cu. ft.

Equivalent ad valorem (1939): Other than hothouse, 18%; hothouse, 7%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 25 cents per cubic foot, which was reduced to 12½ cents, effective November 15, 1941, on grapes entered for consumption during the period February 15 to June 30, inclusive, in any year.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 400, 000	59, 100	340, 900	13, 248	354, 148	Percent 3. 7
Value (\$1,000) ¹	3, 000	2, 200	2, 557	522		
Unit value (cents per pound).....	0. 75	3. 7	0. 75	3. 9		
Persons employed.....	(⁴)					

¹ Marketed as table grapes; about an equal quantity was sold to the wineries.
² Value of production represents farm price; export and import values are for packaged grapes f. o. b. shipping point.
³ Foreign value.
⁴ See under employment.

In 1939, production of table grapes in California was about 800 million pounds, but about half of this was marketed as table grapes, and the other half crushed for wine. There is no production of hot-house grapes in the United States. Imported grapes, which are of the same type as the California table grape, have averaged about 3 percent of the domestic production consumed as table grapes. However, they are marketed in the spring months, whereas the domestic are marketed in the fall. Although a few of the California table grapes, possibly 1 percent of those marketed in the fresh state, are held over in cold storage and marketed in the early part of the import season, generally speaking, the two crops do not compete. Virtually the entire consumption of out-of-season grapes is supplied by imports.

Since 1922, when grapes first began to arrive from Argentina, the trend in imports was steadily upward until a maximum of nearly 14 million pounds (about 400,000 cu. ft.) was attained in 1937. In the 5-year period before the war imports became virtually stabilized at an average level of about 13 million pounds. The chief limiting factor was insufficient refrigerated shipping space, although the United States market for fresh grapes in the off-season is probably capable of only moderate expansion. Import prices (foreign value) declined gradually from about 10 cents per pound to a rather stable level of 3.7 cents, but rose to 3.9 cents in 1939 and 7.7 cents by 1943. A price of 5.5 cents per pound in 1942 did not affect the size of imports, but a shortage of shipping space cut down imports in 1941 and 1943.

In 1939, Argentina supplied 87 percent of the imports of out-of-season grapes; Chile, 11 percent; and South Africa, 1 percent. Imports of grapes in season from other countries had virtually ceased before the war; imports of Belgian hothouse grapes, which had arrived in all months, had declined by 1939 to approximately 50,000 pounds, with a foreign value of about \$19,000.

POST-WAR SHORT TERM

It may be assumed that considerably more shipping and refrigerated cargo space will be available than before the war. However, it is not likely that the market for out-of-season grapes will have developed materially by that time. Assuming that imports will be on about the same average level as before the war, the foreign value of 13 million pounds at a price range of 5 to 7 cents per pound will amount to \$650,000 to \$900,000.

POST-WAR LONG TERM

Although it may be assumed for the long term, as for the short, that more shipping with ample refrigerated space will be available for fresh grapes, it would be difficult to forecast to what extent the domestic market for out-of-season grapes will develop by 1953. Domestic production is not likely to be affected by moderate increases in imports.

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—Assuming that consumption of fresh table grapes would increase at about the same rate as the population, or by about 10 percent, total consumption would amount to approximately 390 million

pounds. If production for the domestic market increased at the same rate, it would approximate 375 million pounds which, at a farm price of 0.75 cent per pound, would have a value of about 2.8 million dollars; total production for the fresh-grape market of 425 million pounds (including exports) would have a farm value of about 3.2 million dollars.

With conditions resembling those of 1939, except that more cargo space would be available, it is possible that the early pre-war trend in imports might be resumed, in which case imports might equal or exceed 16 million pounds (450,000 cubic feet). This volume, at 4 cents per pound, would have a foreign value of \$640,000.

Duty reduced or increased by 50 percent.—The pre-war duty on out-of-season grapes, as imported principally from Argentina and Chile, at 25 cents per cubic foot, was equivalent to about 0.7 cent per pound. Any decrease or increase of the duty within the 50-percent limit is not likely to have much, if any, effect upon the volume of imports.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Consumption might increase as much as 10 percent over that under the lower income, or to about 430 million pounds, of which domestic production might supply 410 million, which at a somewhat higher price, such as 1.25 cent per pound, would have a farm value of 5.4 million dollars; total production going into the fresh-grape market would then be about 475 million pounds, with a farm value of nearly 6 million dollars. The upward trend in imports which prevailed in the 1930's might be accentuated, and imports might increase as much as 50 percent over 1939 or to 20 million pounds (550,000 cubic feet) annually. This volume at 5 cents per pound would have a foreign value of 1 million dollars.

Duty reduced or increased by 50 percent.—As stated above, it is not likely that any change in the duty within the 50-percent limit would affect the size of imports materially.

Exports

In the immediate pre-war period, 1936-40, United States exports of table grapes averaged 63 million pounds annually, valued at 32 million dollars, or double the average during the preceding 5-year period, 1931-35. More than 40 percent of the exports went to Canada, but very recently the exports to the United Kingdom exceeded those to Canada. The European trade, mainly with the United Kingdom and the Scandinavian countries, was lost during the war, and in the post-war period it will probably take many years to regain its pre-war proportions.

Assuming that exports would eventually recover, possibly to 50 million pounds annually, at 1939 prices they would have a value of approximately 1.8 million dollars. Under the higher income and with trade conditions more favorable, the pre-war average might be slightly exceeded, possibly to 65 million pounds which, at a somewhat higher price of 4.5 cents per pound, would have a value of nearly 3 million dollars.

Employment

In 1939, California table grapes were being grown on about 10,000 farms and covered approximately 80,000 acres. At 200 man-hours annually per acre, this acreage required 16 million man-hours, or, at

8 hours per day and 300 days per year, approximately 7,000 man-years of employment. With any increase in production, labor requirements would increase correspondingly.

CURRENTS

Tariff paragraph: 742.
Commodity: Currants.
Rate of duty: 2¢ per lb.

Equivalent ad valorem (1939): 39%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Appar-ent con-sump-tion	Ratio of imports to con-sump-tion
	Total ¹	For domestic market			
Quantity (1,000 pounds).....	5, 100	² 4, 900	3, 460	8, 360	Percent 41
Value (\$1,000).....	³ 200	196	⁴ 175		
Unit value (cents per pound).....	4.0	4.0	5.1		

¹ There were no exports.

² Shipments.

³ Farm value.

⁴ Foreign value.

Owing largely to the increasing use of seedless and seeded raisins United States consumption of currants declined for many years until in the 1930's it tended to be stabilized at 7-8 million pounds annually. In 1931-35, apparent consumption (imports plus domestic shipments) averaged 7.8 million pounds annually and in 1936-39, 7.4 million annually.

As there was virtually no domestic production of currants before 1930, consumption consisted entirely of imports from Greece. Domestic production increased from 1.3 million pounds in 1931-35 to 3.3 million in 1936-39, to 5.1 million in 1939, and to 7.6 million in 1943. On the basis of the small nonbearing acreage of currant grapes and the moderate future sales outlook, it seems unlikely that the output in California will soon exceed 8 million pounds.

Imports declined from an average of 26 million pounds in the 1921-25 period to 11 million in 1926-30, 6.6 million in 1931-35, and 4.6 million in 1936-39. In the 1931-35 period, imports constituted 84 percent of consumption, and in the 1936-39 period, 55 percent. By 1939 imports were down to 3.5 million pounds and 41 percent of consumption. There has been very little fluctuation in the foreign value of imported currants; in the 1931-35 period the import or foreign value price averaged 5.7 cents per pound, and in the 1936-39 period, 5.5 cents.

POST-WAR SHORT TERM

Although there is considerable uncertainty in both instances, it is assumed that after the war the low level at which consumption of currants was stabilized during the 1930's will tend to continue and that production in California, not all of which will necessarily be marketed as dried currants, will not be much, if any, above 8 million pounds.

There may be less demand for imports after the war, as consumers in general will have become accustomed to get along without them, and California producers will probably be in a position to supply the demand. However, because of their distinct and unusual flavor, a demand for Greek currants will probably revive, but imports are likely to be resumed at a much reduced rate.

POST-WAR LONG TERM

Consumption, Production, and Imports

After the war there will probably still be a demand for imported currants by a few consumers who prefer the Greek type, but imports will probably arrive in small and constant quantities and not be much affected by an increase or decrease by 50 percent in the duty, at least not enough to make estimates of such changes possible.

Per capita income at 1939 level.

In view of the downward trend in consumption of currants in the pre-war period, per capita consumption of the late 1930's is not likely to be exceeded, hence total consumption might be around 8 million pounds, part of which might be supplied by imports. Production of 6.8 million pounds at 4 cents per pound would have a farm value of \$270,000. Possibly imports would amount to 1.2 million pounds, or to about 15 percent of consumption, which, at a price of 5.5 cents per pound, would have a foreign value of about \$66,000.

Per capita income increased by 75 percent.

Notwithstanding its downward trend in the 1930's, consumption might increase somewhat at the higher level of income, but the increase would probably be mostly in imports. Domestic production of 7 million pounds at the higher price of 5 cents per pound would have a value of \$350,000. Total consumption might reach 9 million pounds annually, and imports rise to 2 million pounds, or to more than 20 percent of consumption, which at 6.5 cents per pound would have a foreign value of \$130,000.

Employment

Currant grapes, a large percent of which are marketed as fresh grapes, are grown on about 3,000 acres, out of a total for all California grapes of more than 500,000 acres. They are grown on 200 to 300 farms out of a total for all grapes in California of about 40,000 farms. Employment, which averages about 200 man-hours annually per acre of California grapes, on 3,000 acres, would amount to 250 man-years.

OLIVES, EDIBLE

<i>Tariff paragraph</i>	<i>Commodity</i>	<i>Rate of duty</i>	<i>Equivalent ad valorem (1939)</i>
744-----	Olives, edible:		
	Green, in brine.....	20¢ per gal.....	} 33%.
	Ripe, in brine.....	30¢ per gal.....	
	Pitted and stuffed, in brine.....	30¢ per gal.....	
	Dried ripe.....	5¢ per lb.....	
	Olives, n. s. p. f.....	5¢ per lb.....	

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Appar-ent con-sump-tion	Ratio of imports to con-sump-tion
	Total	Used for edi-ble pur-poses	For do-mestic market ¹			
Quantity (1,000 pounds).....	46,000	32,600	32,600	² 38,455	71,055	<i>Percent</i> 54
Value (\$1,000).....	³ 1,702	³ 1,467	1,467	⁴ 4,872		
Unit value (cents per pound).....	3.7	4.5	4.5	12.7		
Persons employed.....	(⁵)					

¹ Exports were negligible.

² Imports of olives in brine converted on the basis of 6 pounds per gallon. Average annual imports in 1937-39 amounted to 36.5 million pounds.

³ Estimated farm value.

⁴ Foreign value.

⁵ See under employment.

Fresh olives may be crushed for oil or processed for edible purposes. This section is limited to olives for edible purposes. Being very bitter to the taste, fresh olives, whether green or ripe, are processed before they are consumed. The principal forms in which olives are marketed are: Pickled green in brine, pitted and stuffed green in brine, and canned ripe. Small quantities are marketed as dried ripe and spiced olives.

Per capita consumption follows changes in consumer income only to a small extent. In 1939, it amounted to 0.54 pound, compared with 0.44 pound in 1932-33. The United States produces all of its consumption of canned ripe olives, 10 percent of the green olives in brine, but only insignificant quantities of pitted and stuffed green olives. Imports, which contribute about 54 percent of the total quantity consumed, usually supply almost all of the pitted and stuffed olives and 90 percent of the green olives in brine. Virtually all imported pitted and stuffed green olives in brine and 95 percent of green olives in brine come from Spain. These imports are shipped in barrels from Spain and are repacked in various sizes of glass containers in the United States.

Total production in 1939 was only 46 million pounds, of which 32.6 million pounds was used for edible purposes, whereas production for the years 1937-39 averaged 61 million pounds, of which 53 percent, or 32 million pounds, was processed for edible purposes.

POST-WAR SHORT TERM

Because of the long-term upward trend of per capita consumption of olives and because of the increase in population, it seems probable that total consumption in the immediate post-war period may be about 10 percent higher than in 1939. Domestic production and imports may be expected to supply about the same proportions of the total as they did before the war, possibly varying somewhat under different assumed duty changes.

POST-WAR LONG TERM

Consumption, Production, and Imports

Because of the difference in type between domestic and imported olives, a decrease or increase in duty by 50 percent is not likely to affect domestic production materially. At a given level of national income, with production given, the level of consumption depends on the level of imports which in turn is affected by the rate of duty.

Per capita income at 1939 level.

United States production of edible olives may be about 38 million pounds valued at around 1.7 million dollars, or about 15 percent above 1939, irrespective of the assumed duty changes.

Duty as in 1939.—Consumption per capita of olives seems likely to remain at about the same level as in 1939, which, allowing for increase in population, would be about 80 million pounds. Imports would amount to about 42 million pounds, with a foreign value of about 5.3 million dollars and supply about 52 percent of consumption.

Duty reduced by 50 percent.—Imports might amount to about 47 million pounds, with a foreign value of about 5.8 million dollars, and supply about 55 percent of a consumption of about 85 million pounds.

Duty increased by 50 percent.—Imports would supply about 37 million pounds, with a foreign value of about 4.5 million dollars, and supply about 49 percent of a consumption of about 75 million pounds.

Per capita income 75 percent higher than in 1939.

Consumption of olives might increase considerably, and, depending in part on the rate of duty in effect, might be 90–100 million pounds. Production would probably increase 40 percent above 1939, or to about 45 million pounds, valued at 2.3 million dollars.

Duty as in 1939.—Imports would supply about 50 million pounds, or about 52 percent of a consumption of about 95 million pounds and have a foreign value of about 8 million dollars.

Duty reduced by 50 percent.—Imports might supply about 55 million pounds, with a foreign value of 8.8 million dollars and supply about 55 percent of a consumption of nearly 100 million pounds.

Duty increased by 50 percent.—Imports might total about 45 million pounds, or about 49 percent of a consumption of about 90 million pounds, with a foreign value of about 7.2 million dollars.

Employment

No data are available regarding the number of workers engaged in olive production. In 1939, 4,898 farms reported production of olives. Picking olives for edible purposes requires a great deal of hand labor for short periods. The United States Department of Agriculture estimates that 179 man-hours per acre are required each year in growing olives. On this basis, 1,790 man-years of labor were required in 1939 for 24,000 acres of bearing olives. For the post-war long term on the lower level of income the labor requirements would be about 2,027 man-years and on the higher level of income about 2,500 man-years.

In addition to these workers, it is estimated that about 1,000 persons are employed in repacking imported green olives.

FRESH PINEAPPLES

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
747-----	Fresh pineapples:		
	Crates:		
	Cuba-----	20¢ each crate-----	} 19%
	Other than Cuba-----	35¢ each crate-----	
	Bulk:		
	Cuba-----	1/2¢ each-----	} 28%
	Other than Cuba-----	2/10¢ each-----	

NOTE.—In the trade agreement of 1934 with Cuba, the rate per crate to Cuba was reduced from 40 cents to 20 cents, and on pineapples in bulk from 1 1/2 cents to 1/2 cent each. The general rate was reduced in the agreement of 1935 with Haiti from 50 cents to 35 cents per crate, and from 1 1/4 cents to 1/2 cent each for pineapples in bulk. The bulk rate was again reduced in the agreement with Mexico in 1943 to 2/10 cent each, which automatically reduced the rate to Cuba to 0.48 cent each.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 crates)-----	593	29	564	1,400	1,984	Percent 72
Value (\$1,000)-----	1,091	60	1,038	1,261		
Unit value (per crate)-----	\$1.84	\$2.06	\$1.84	\$0.90		

¹ Foreign value.

² Although imports came in at an average price of 90 cents per crate in 1939, the average price of imports from Cuba was \$1.04 and of those from Mexico (in bulk), 39 cents.

United States consumption of fresh pineapples, which amounted to about 2 million crates in 1939, has varied but little as a whole, although there has been some tendency for it to decline or increase with changes in consumer income. In the 1921-25 period, total consumption averaged 1.6 million crates annually; in 1926-30, 1.8 million; in 1931-35, 1.4 million; and in 1936-40, 1.8 million crates. The weighted average price of all pineapples entering into consumption during these four periods was \$2.10, \$2.23, \$1.82, and \$1.30 per crate, respectively.

The only pineapple production in the continental United States is about 10,000 crates in Florida. Puerto Rico supplied 400,000 to 600,000 crates annually, and Hawaii, 30,000 to 123,000. Total production in Hawaii is usually 20 million crates, most of which is canned, whereas most of the production in Puerto Rico, at least before the war, was shipped fresh. Imports came from Cuba and Mexico. Most of the imports from Cuba, usually more than 1 million crates per year, are in crates, whereas those from Mexico, the equivalent of 387,000 crates in 1939, are in bulk.

During United States participation in the war, the supply of fresh pineapples in continental United States has been greatly reduced as a result of the shipping shortage. The sharp decline in imports from Cuba accounted for most of the decrease, although shipments from Hawaii were also reduced, and those from Puerto Rico discontinued altogether. Imports from Mexico, which had been much smaller

than those from Cuba, almost doubled, and will probably continue to enter in increased volume after the war as they are low in price and suitable for canning in the United States.

POST-WAR SHORT TERM

Consumption will probably be about the same as before the war, as ample shipping will probably again be available to carry the fresh fruit from Cuba, Puerto Rico, and Hawaii. Although shipments of the fresh fruit from Puerto Rico were discontinued during the war, it is expected that they will soon be resumed, and that those from Cuba and Hawaii will be about as large as before the war. Imports from Mexico will probably continue to enter as before and during the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

On the basis of past experience and probable changes in conditions in the future, it appears that shipments from Puerto Rico will continue within the pre-war limits and that those from Hawaii may increase considerably because of the great increase in the Pacific coast population. Imports from Cuba, on the other hand, should just about keep pace with the growth in population and probably be affected somewhat by variations in consumer income, and those from Mexico continue their upward trend.

Per capita income at 1939 level.

Duty as in 1939.—Except for the possibility of unusually large increases in imports from Mexico, most of which would be canned after arrival, it is assumed that the increase in consumption will be only about enough to account for the increase in population. Total consumption might thus amount to about the equivalent of 2.2 million crates. This might be distributed about as follows: Shipments from Puerto Rico and Hawaii, 600,000 crates, valued at approximately 1 million dollars; and imports from Cuba and Mexico equivalent to about 1.6 million crates, with a foreign value of approximately 1.4 million dollars.

Duty reduced or increased by 50 percent.—If the duty should be reduced or increased by 50 percent, imports would probably increase or decrease but slightly, possibly by 10 percent. Shipments into continental United States from insular possessions would probably be little affected, but consumption would probably increase or decrease according to the volume of imports. A 10 percent increase in imports would give total imports of about 1.8 million crates, with a foreign value of approximately 1.6 million dollars, whereas an increase in the duty might cause imports to decline 10 percent to about 1.4 million crates, with a foreign value of approximately 1.3 million dollars.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Under the higher income, consumption might be 20 to 25 percent higher than under the lower income, or the equivalent of approximately 2.7 million crates. The origin of this increased consumption might be about as follows: Shipments of about 700,000 crates from Puerto Rico and Hawaii, valued at approximately 1.3 million dollars, and imports equivalent to about 2 million crates, with a foreign value of approximately 2 million dollars.

Duty reduced or increased by 50 percent.—As under the lower income, changes in duty would probably have but a moderate effect on imports. A reduction in the duty might cause imports to rise by about 10 percent, or to about 2.2 million crates, with a foreign value of approximately 2.2 million dollars, and an increase in the duty might cause imports to decline, possibly to about 1.8 million crates, with a foreign value of approximately 1.8 million dollars.

Exports

United States exports of pineapples have consisted for the most part of shipments of Puerto Rican pineapples to Canada. Before the war, they averaged about 30,000 crates annually, valued at nearly \$60,000. Exports after the war would probably not exceed 50,000 crates, valued at \$100,000 in any one year.

Employment

In Puerto Rico, the area planted to pineapples for the fresh-fruit trade (500,000 crates) amounted to about 3,300 acres, on which employment was estimated at about 66,000 man-days, or approximately 220 man-years. In Hawaii, the area in pineapples for the fresh-fruit trade alone (about 100,000 crates), probably did not exceed 300 acres at any one time. On this acreage the labor requirements were estimated at about 6,000 man-days or approximately 20 man-years.

PINEAPPLES, PREPARED OR PRESERVED

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
747-----	Pineapples, prepared or preserved, n. s. p. f.:		
	Philippines-----	Free.	
	Cuba-----	$\frac{1}{2}$ ¢ per lb.	14%
	Others-----	$1\frac{1}{2}$ ¢ per lb.	40%

NOTE.—The rate in the Tariff Act of 1930 was 2 cents per pound with a 20 percent reduction in favor of Cuba. The trade agreement with Cuba, effective September 3, 1934, reduced the Cuban rate from 1.6 cents to 0.8 cent. The trade agreement with the United Kingdom, effective January 1, 1939, reduced the general rate from 2 to $1\frac{1}{2}$ cents. The trade agreement with Mexico further reduced the general rate to 1 cent per pound, effective January 30, 1943.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to con- sumption
	Total	For ex- port	For do- mestic market			
Quantity (1,000 pounds)-----	563, 048	23, 350	539, 698	74, 892	614, 590	Percent 12
Value (\$1,000)-----	36, 092	1, 792	34, 300	¹ 2, 985		
Unit value (cents per pound)-----	6.4	7.7	6.4	4.0		
Persons employed-----	(²)					

¹ Foreign value.

² See employment.

The classification "pineapples, prepared or preserved" represents mostly pineapples canned in syrup, but includes also small quantities in brine or water for the use of manufacturers of candied or glace pineapple. In the pre-war period 1936-40, average annual consumption of canned pineapples in continental United States amounted to 645 million pounds. Per capita consumption increased from 2.7 pounds in 1921-25 to 4.8 pounds in 1936-40; by 1943 it had decreased by about half.

United States production of canned pineapples is centered in Puerto Rico and Hawaii, the latter supplying more than 90 percent of the total. Production in 1939 was about 10 percent below the average.

Imports in the early 1930's averaged 8.7 million pounds annually, but by 1939, owing to the large increases from the Philippines, Formosa, and Cuba, were up to 75 million pounds, 60 percent of which came from the Philippines free of duty. The origin of the imports in 1939 was distributed as follows:

Country	Quantity <i>1,000 pounds</i>	Foreign value	
		<i>1,000 dollars</i>	<i>Cents per pound</i>
Cuba.....	12,249	680	5.5
British Malaya.....	1,766	75	4.2
Formosa.....	16,189	556	3.4
Philippine Islands.....	44,633	1,672	3.7
Australia.....	52	3	6.7
All others.....	4	(1)	8.6
Total.....	74,893	2,985	4.0

¹ Less than \$500.

During the war, imports from the Far East have ceased and total imports by 1943 were down to 35 million pounds; of these, Cuba supplied 33 million compared with 12 million in 1939. The foreign prices of combined imports and shipments declined from an average of 8.8 cents per pound in 1921-25 to 6.2 cents in 1936-40.

POST-WAR SHORT TERM

United States consumption is likely to be below the pre-war average and may not exceed 500 million pounds. Production in Hawaii, the chief source, which has been severely affected by the war, will probably not have fully recovered, and the industry in Puerto Rico will probably go back to shipping fresh pineapples, although it may continue to supply its pre-war shipments of about 4 million pounds. Thus the combined output of Hawaii and Puerto Rico may not exceed 450 million pounds. Imports will probably continue to be 35-50 million pounds, virtually all of which will be from Cuba, as the Philippines and other Far Eastern sources will probably not have recovered sufficiently to be heavily in the market. Prices are likely to continue high.

POST-WAR LONG TERM

Consumption, Production, and Imports

United States per capita consumption will probably continue to increase in the post-war period, but not necessarily at the same rapid rate as before the war. Although Hawaii and Puerto Rico will probably continue to supply the major part of consumption, imports may supply a relatively larger part than formerly. In discussion of the estimates set forth below, it is assumed that domestic production will not exceed 700 million pounds annually and that any excess in consumption over this figure will be supplied by imports. Post-war imports will probably come largely from Cuba, especially if imports from the Philippines are subject to duty.

Per capita income at 1939 level.

Continuing, but in somewhat lessening degree, the pre-war upward trend in per capita consumption, and allowing for an increase in population, annual consumption might be around 780 million pounds. Domestic production might supply an average of 650 million pounds, which at a price of 6.25 cents per pound would have a value of approximately 41 million dollars. Imports might supply roughly 15 percent of consumption and be approximately 130 million pounds, which at an average price of 5 cents per pound would have a foreign value of 6.5 million dollars.

Imports might vary as much as 15 percent in either direction depending on whether the duty was reduced or increased 50 percent. In case of a reduction in the duty, imports might increase to approximately 150 million pounds, with a foreign value of 7.5 million dollars, and in case of an increase in the duty, imports might decline to about 110 million pounds, with a foreign value of approximately 5.5 million dollars.

Per capita income 75 percent higher than in 1939.

Before the war, per capita consumption responded readily to changes, especially increases, in national income, and might increase to more than 6 pounds per capita. Allowing for this and for increased population, total consumption might approximate 900 million pounds. The change in the living standard would probably have little effect on domestic production, which might be expected to be at a maximum of approximately 700 million pounds. The price would probably be higher, however, than at the lower level, perhaps 7 cents per pound, in which case production would have a value of 49 million dollars. Imports might supply approximately 20 percent of consumption and amount to about 200 million pounds; if the foreign prices likewise were somewhat higher, perhaps at 6 cents, the foreign value of imports would be 12 million dollars.

Imports might fluctuate with 50-percent changes either way in the duty, but at the higher prices, the duty being specific, the fluctuations should be relatively less, perhaps 10 percent. In case of a reduction in the duty, imports might increase to approximately 13 million dollars, and in case of an increase in duty, imports might decline to a value of approximately 11 million dollars.

Exports

Exports of canned pineapple in the pre-war period averaged about 24 million pounds, valued at 1.8 million dollars. More than 50 percent went to the United Kingdom; other important markets were Belgium, Sweden, Switzerland, Canada, and France. Over the long term, exports may be as important as before the war, and might possibly expand somewhat. They will doubtless continue to be small compared with production or consumption.

Employment

In Hawaii, the pineapple canneries employed from 4,000 to 18,000 persons monthly, with 3 months of full employment. Pineapples were reported for 233 farms, and covered nearly 50,000 acres, employment on which amounted to approximately 1 million man-days or 3,300 man-years. Total employment might increase as much as 10 percent under conditions of maximum production.

Before the war there was one cannery in the pineapple-growing district of Puerto Rico which employed about 300 persons part time. Pineapples were grown on more than 500 farms and covered about 4,000 acres, employment on which amounted to approximately 80,000 man-days, or 270 man-years. In the pineapple acreage is included that on which pineapples are grown for the fresh-fruit trade.

PEARS

Tariff paragraph: 740.

Commodity: Pears, green, ripe or in brine.

Rate of duty: ½¢ per lb.

Equivalent ad valorem (1939): 16%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1,463,950	97,193	1,366,757	4,228	1,370,985	Percent 0.3
Value (\$1,000).....	19,519	3,284		130		
Unit value (cents per pound).....	1.3	3.4		3.1		
Persons employed.....	(¹)					

¹ Farm value.

² Foreign value.

³ See under employment.

About 70 percent of all pears produced in the United States are consumed in the fresh state, the remainder being canned or dried. Of those consumed fresh, the great bulk is used during the months from the harvest in summer and fall through December. Virtually all of the commercial pears consumed in these months are Bartletts, which are superior in flavor and texture but which deteriorate much more rapidly than other varieties when kept in cold storage. In order to supply the demand for fresh pears when domestic Bartletts are nor-

mally off the market, other varieties (the so-called winter pears), which stand up better in storage, are produced.

Total consumption of pears in the United States increased from an annual average of 1 billion pounds in 1921-30 to 1.1 billion pounds during 1931-35, and 1.3 billion pounds during 1936-40. This increase in consumption was induced in part by the lower prices which prevailed throughout the 1930's as compared with the preceding decade, and in part by the increased production of winter pears. Loss of the European market after 1938 increased the quantity of both domestic winter pears and the imported Bartlett pears on the United States market.

The principal consuming centers in the United States are the large urban areas in the eastern part of the country. Throughout the months when domestic Bartlett pears are available, consumption is supplied by domestic pears and, prior to 1935, domestic winter pears were virtually the only ones consumed during the late winter and spring months. Beginning in 1935 Bartlett pears from Argentina have been imported during the winter or off-season months; most of them enter during February-March, but some are imported throughout the spring.

Pears are grown in every State of the Union, but commercial production is centered in the three Pacific Coast States, with over two-thirds of the total production and 90 to 95 percent of winter pears. United States production of pears increased rapidly over the two decades before World War II, and, on the basis of present plantings, is likely to remain near the average annual yield of 1.5 billion pounds attained during the 5-year period 1936-40. Contributing substantially to the expansion of total pear production was the development of winter varieties of pears, largely in response to the demand of the export trade for which these pears were well adapted. Although prices fell in the early 1930's and remained comparatively low throughout the decade, production of winter pears increased to a peak of 349 million pounds in 1938, but fell off thereafter and averaged 243 million pounds annually during 1941-44. In the 5-year period 1936-40 winter pears represented 20 percent of the total pear production and accounted for three-fourths of total exports.

Imports from Argentina (the chief source) have risen from 151,000 pounds in 1935 to a peak of 15 million pounds in 1941 when European markets were cut off. About two-thirds of the imports arrive during the months February-March, but in recent years have extended on into April, May, and June. Imports, consisting of the Bartlett variety, compete with domestic cold-storage pears of which an average of about 49 million pounds, or 16 percent of the domestically produced winter-pear crop, were available annually during the period 1936-40.

POST-WAR SHORT TERM

It appears likely that consumption of pears in the short term will be somewhat higher than it was in pre-war years. The export trade, which formerly absorbed 50 percent of the production of winter pears, is not expected to attain its former levels during this period. Depending in large part upon the market for pears in Europe, imports may be somewhat greater than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

In the long run the volume of production and the returns to the domestic industry as well as the foreign trade in pears will depend to a considerable extent upon the condition of the large European markets. If European consumers enjoy a comparatively high level of income, these markets may be expected to absorb large quantities of pears from the United States, Argentina, and other pear-producing countries. In this event the price of pears in the United States as in world markets would be relatively high and imports into the United States would probably vary with the demand for fresh Bartlett pears during late winter. Under conditions of high per capita income, such demand would be expected to be comparatively great. Conversely, if the European markets are unable to take substantial quantities of foreign pears, United States exports would be comparatively small and other producing countries, notably Argentina, would be under pressure to sell to the remaining markets, including the United States. In this situation, which would be most likely to occur under generally depressed economic conditions, the price of pears in the United States as in world markets would be relatively low. Even at the low prices, however, the quantity of pears imported into the United States would not be expected to be as great as under more prosperous economic conditions. The extent of the recovery of European markets will undoubtedly have more effect upon United States imports of pears than a change in the duty of 50 percent in either direction.

Per capita income at 1939 level.

Duty as in 1939.—At this level of income the world supply of pears may tend to exceed the demand and prices may be expected to be comparatively low, possibly around the 1939 level. With a per capita consumption about the same as in 1939, total consumption in the United States may, because of a larger population, be around 1.5 billion pounds. Despite the possibility of low prices in the United States, imports from Argentina may amount to about 8 million pounds, with a foreign value of \$250,000. In this event imports would represent about one-half of 1 percent of total consumption. Production for the domestic market would, as it has in the past, supply most of the consumption and may approach 1.5 billion pounds, valued at 20 million dollars.

Duty reduced by 50 percent.—Under these conditions imports may tend to be somewhat greater than if the 1939 duties were in effect and may amount to, say, 8½ million pounds, with a foreign value of \$265,000. Consumption and production would be approximately the same as though the 1939 rates were in effect.

Duty increased by 50 percent.—Such an increase in duty may result in imports of around 7¼ million pounds, with a foreign value of \$216,000. Consumption and production would be approximately the same as though the 1939 rates were in effect.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—The demand for pears under a high level of per capita income would be substantially higher than under a low income, and consumption may average 1.8 billion pounds. Imports, in

response to high prices in the United States, may treble those of 1939 and amount to, say, 12 million pounds, and represent around one-half of 1 percent of total consumption. Prices of pears would probably be substantially above those of 1939 as the increased demand which is anticipated would provide a strong market for the available pears and new plantings which may be induced would hardly have attained full-bearing age. With the price of Argentine pears about 5 cents per pound, the foreign value of imports may approximate \$600,000. Production for the domestic market may amount to nearly 1.8 billion pounds. With farm prices about 2 cents per pound, the total farm value of production may approach 36 million dollars.

Duty reduced by 50 percent.—Under these conditions imports might be somewhat greater than if the 1939 duties were in effect and may total, say, 12½ million pounds, with a foreign value of \$638,000. Consumption and production would thus be about the same as though the 1939 rates were in effect.

Duty increased by 50 percent.—Such an increase in duty might reduce imports to about 11 million pounds, with a foreign value of \$550,000. Consumption and production would be virtually the same as though the 1939 rates were in effect.

Exports

Exports of pears, which averaged about 45 million pounds in 1923 and 1924, increased to 70 million pounds in 1929 and to 177 million pounds in 1938. The marked expansion in exports, however, has been accompanied by an appreciable decline in the average unit value. Prior to 1940 the United Kingdom took over 50 percent of United States exports and France, the Netherlands, and Canada were the other major markets. The increase in exports to Europe in spite of adverse economic conditions and various import restrictions, is ascribable largely to the activity of American exporters and to the increasing surplus and low prices of pears in the United States. Beginning with the 1938-39 season, the Government subsidized exports to "new" markets.¹

The bulk of the exports are shipped before the first of the year, thus avoiding competition from Southern Hemisphere countries. The expansion of production and exports in the Southern Hemisphere countries, particularly Argentina, Australia, and New Zealand, may materially affect future exports of pears from the United States, which, however, will probably increase with high world income.

Employment

Average labor requirements to produce an acre of pears are estimated to be 158 man-hours. The estimated 180,000 acres devoted to pears would thus represent full-time employment for approximately 11,851 persons.

¹ Under an agreement between the Secretary of Agriculture and the Oregon-Washington-California Pear League, Inc., a payment of 50 cents per box containing 46 pounds was made in the 1938-39 season, and renewed at 40 cents per box for 1939-40 and 1940-41 seasons to members of this organization who exported pears to certain foreign countries which did not normally import pears in any appreciable quantity. The last agreement was for the 1941-42 season when 30 cents per box was paid.

AVOCADOS.

Tariff paragraph: 750.

Commodity: Avocados.

Rate of duty: General, 15¢ per lb.; Equivalent ad valorem (1939): 150%.
Cuba free.

NOTE.—Imports from Cuba restricted to the period June 1 to September 30 of each year by exchange of notes at the time of the Cuban trade agreement of 1934. The ad valorem equivalent shown above is based on imports of 50 pounds, with a unit value of 10 cents per pound, from countries other than Cuba; all other imports shown are free of duty from Cuba, and the average foreign value of these imports was only 1.8 cents per pound in 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below.

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For domestic market ¹			
Quantity (1,000 pounds).....	20,600	20,600	² 7,927	28,527	Percent 23
Value (\$1,000).....	³ 1,483	1,483	⁴ 146		
Unit value (cents per pound).....	7.2	7.2	1.8		

¹ Exports were negligible.

² From Cuba, except 50 pounds valued at \$5; does not include 18,520 pounds valued at \$365 imported into the Virgin Islands of the United States.

³ Farm value.

⁴ Foreign value.

Consumption of avocados, a high-priced and comparatively new fruit on the American market, has been small but was increasing during the years before World War II. Although subject to wide fluctuations from year to year, annual average consumption increased from 19 million pounds during 1931-35 to 33 million pounds in 1936-40 and to 44 million pounds in 1941-44.

Both United States production and imports were increasing throughout the 1930's although production increased at a more rapid rate; annual average production doubled while imports increased by one-third. The consumption, production, and imports of avocados in 1939, as shown in the above table, were below the pre-war averages (1936-40) of 33, 23, and 10 million pounds, respectively.

Imports of avocados from Cuba, the predominant source, are restricted by agreement¹ to the period June 1 to September 30, inclusive, when domestic supplies are at a low level. Although temporarily curtailed by the war, imports from Cuba are likely to resume their pre-war upward trend as more shipping space becomes available.

There is little likelihood of sizable imports from countries other than Cuba owing to Quarantine Regulation No. 56 which restricts importation of avocados from Mexico and Central American countries because of the danger of infestation by the avocado weevil. Avocados from Mexico may be admitted if the pits are removed, but in this condition they deteriorate rapidly when shipped long distances and are limited, therefore, to markets close to the border. In any case, the dutiable imports would probably be insignificant so long as Cuban avocados enter free.

¹ An exchange of notes, made in connection with the Cuban Trade Agreement of 1934.

POST-WAR SHORT TERM

Consumption of avocados will probably continue to increase and be considerably above the low level in 1939 as domestic production seems likely to continue its upward trend and imports undoubtedly will be resumed.

POST-WAR LONG TERM**Consumption, Production, and Imports**

Consumption of avocados may continue its upward trend as the fruit is rapidly increasing in popularity. Furthermore, increased supplies may become available as the yield expands from a comparatively large number of young trees. Since imports from most producing countries are subject to restrictive quarantine regulations, thus virtually excluding imports except from Cuba, and as imports from Cuba are duty-free, a 50-percent decrease or increase in the general rate of duty would have little effect. Although imports from Cuba may increase somewhat over the pre-war average, the proportion of such imports to consumption may decline owing to the more rapid increase in production in this country.

Per capita income at 1939 level.

Largely as a consequence of the upward trend in production, consumption is likely to rise and average about 65 million pounds. Owing to relatively low prices to be expected during this period, imports may average about the same as pre-war years, namely, 10 million pounds with a foreign value of 180,000 dollars. Domestic production would probably amount to 55 million pounds valued at about 3.8 million dollars.

Per capita income 75 percent higher than in 1939.

The demand for avocados under this high level of per capita income would be substantially higher than under the lower income level, and, for a considerable period, may tend to outrun supplies until newly planted trees come into bearing.² Consumption during the early and middle 1950's may average 80 million pounds. Under these conditions it may reasonably be expected that prices would be comparatively high, say, 12 cents per pound (farm value). Owing to more intensive cultivation and heavy applications of fertilizer induced by high prices, domestic production may average 65 million pounds. The value of this output may be around 8 million dollars. Imports in response to high prices in the United States may increase to approximately 15 million pounds or about 20 percent of consumption, with a foreign value of 750,000 dollars.

Exports

Exports, if any, are negligible, and there is little likelihood of any in the post-war period.

Employment

Average labor requirements per acre to produce avocados is estimated to be 84 man-hours; the 1939 crop of 13,000 acres represented an equivalent of 455 man-years. To produce the estimated crop of

² Nearly 10 years are required for avocado trees to come fully into bearing. Under the stimulus of a high level of income, therefore, trees may be planted during the late 1940's and early 1950's, but not be fully bearing before 1960.

55 and 65 million pounds in the long-term period discussed above about 472 and 490 man-years, respectively, would be required.

JELLIES, JAMS, MARMALADES, AND FRUIT BUTTERS

Tariff paragraph: 751.

Commodity: Jellies, jams, marmalades, and fruit butters.

Rate of duty: General, 20% ad val.; Equivalent ad valorem (1939): 20%;
Cuba, 14% and 16% ad val.

NOTE.—The rate fixed in the Tariff Act of 1930 was 35 percent ad valorem (28 percent on Cuban product). Pursuant to the Trade Agreement with Cuba, effective September 3, 1934, the duty was reduced on Cuban products to 14 percent, except on orange marmalade. Pursuant to the trade agreement with the United Kingdom, effective January 1, 1939, the general rate was reduced to 20 percent and the rate on Cuban orange marmalade was automatically reduced to 16 percent. A further reduction to 17½ percent was made on quince products, effective November 15, 1941, pursuant to the agreement with Argentina.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....		1, 191		3, 546		Percent ----- 1.5
Value (\$1,000).....	35, 857	181	35, 676	1 547	36, 223	
Unit value (cents per pound).....		15.2		11.9		
Persons employed (number).....	(¹)					

¹ Landed value; foreign value was \$421,000.

² Foreign value.

³ See under employment.

In 1939, recorded domestic consumption of jellies, jams, marmalades, and related products had a value of 36 million dollars, of which imports, with a landed value of \$547,000, constituted about 1.5 percent.

The value of domestic output has fluctuated with the level of consumer income and with changes in prices; it declined from a value of about 42 million dollars in 1929 to 20 million in 1933, and increased to 36 million by 1939, of which one-half of 1 percent was exported.

Imports in 1939 consisted of 62 percent orange marmalade, and 38 percent of miscellaneous jellies and jams; 97 percent of the orange marmalade and 55 percent of the jellies and jams came from the United Kingdom. Canada and Cuba supplied each about 10 percent of the latter.

Imports of jellies, jams, and marmalades (including orange marmalade) declined from an average of 3.8 million pounds, with a foreign value of \$541,000 in the 1926-28 period, to 2.3 million pounds, valued at \$279,000 in 1936-38, although there was no change of duty.¹ When the duty on orange marmalade was reduced from 35 to 20 percent ad valorem in the 1939 agreement with the United Kingdom, average imports for 1939 and 1940 increased to 3.4 million pounds, valued at \$400,000. This increase was due solely to doubling of the imports of orange marmalade, since the imports of jellies and jams were not affected.

¹ Jellies, jams, and orange marmalade, before 1929, were combined in one import class. They are still combined in one export class, as well as in the statistics of the United States Biennial Census of Manufactures.

During the recovery period of the late 1930's, imports of jellies and jams increased somewhat over those of the depression period, but those of orange marmalade did not respond to the increase in consumer income, declining somewhat, probably because of increasing competition with marmalade of domestic manufacture. On the other hand, the lowering of the duty had a marked effect on imports of orange marmalade but none on those of miscellaneous jellies and jams.

Prices (foreign value) of imports have varied somewhat with the level of national income; average prices of jellies and jams increased from 12 cents per pound in 1931-35 to 13.3 cents in 1939; those of orange marmalade increased from 10.5 cents per pound to 11.2 cents.

POST-WAR SHORT TERM

During the war, imports of jellies and jams have continued at almost pre-war levels, but those of orange marmalade have virtually ceased. Soon after the war, imports of jellies and jams as well as those of orange marmalade will probably be resumed at the pre-war rate of 1939 and 1940.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

As a basis for further estimates, it may be assumed that in the post-war long term, United States consumption of jellies, jams, and marmalades will increase about as rapidly as the population; that a 50-percent reduction or increase in the duty might affect imports of orange marmalade as much as 50 percent either way, and of the entire group by approximately 30 percent.

Consumption might increase to approximately 40 million dollars; it would probably be little affected by changes in the relatively small imports.

Duty as in 1939.—Imports might have a foreign value of about \$450,000, or a landed value of \$585,000, supplying about 1.4 percent of consumption; production for the domestic market might have a value of about 39.4 million dollars.

Duty reduced by 50 percent.—Imports might have a foreign value of about \$585,000, or a landed value of \$700,000, supplying about 2 percent of consumption; production for the domestic market might then have a value of approximately 39.3 million dollars.

Duty increased by 50 percent.—Imports might have a foreign value of about \$315,000, or a landed value of about \$440,000, supplying a little over 1 percent of consumption; and production for the domestic market might then have a value of approximately 39.6 million dollars.

Per capita income 75 percent higher than in 1939.

Domestic production and consumption in the past seem to have responded readily to changes in national income, hence consumption might increase by as much as 25 percent, in addition to that required by the 10 percent increase in population, which at possibly 30 percent higher prices than in 1939 would raise consumption to a value of about 65 million dollars. Imports might increase in quantity and value in about the same ratio.

Duty as in 1939.—Imports might increase to a foreign value of about \$750,000, or a landed value of \$975,000, supplying about 1.4 percent of consumption; production for the domestic market might then have a value of about 64 million dollars.

Duty reduced by 50 percent.—Imports might have a foreign value of \$975,000, or a landed value of about 1.2 million dollars, supplying about 2 percent of consumption; production for the domestic market might then have a value of about 63.8 million dollars.

Duty increased by 50 percent.—Imports might have a foreign value of about \$525,000, or a landed value of nearly \$735,000, supplying a little over 1 percent of consumption; production for the domestic market might then have a value of about 64.3 million dollars.

Exports

United States exports of jams, jellies, marmalades, and similar products in 1939 amounted to about 1.2 million pounds, valued at \$181,000. Exports had a value of \$455,000 in 1929 but declined to \$90,000 in 1932 and 1933. Exports before the war were widely distributed, but went mostly to the United Kingdom, Canada, the Canal Zone, and the Philippines. After the war, this export trade might average about \$250,000, and, in the case of a high level of world income be as high as \$500,000.

Employment

In 1939, establishments primarily engaged in the manufacture of preserves, jams, jellies, marmalades, and fruit butters, employed about 5,000 persons (average for the year not including persons employed in growing the fruit), whose total salaries and wages amounted to more than 5 million dollars. With production over 60 million dollars annually there might be as many as 7,500 persons employed in this industry.

FLOWER BULBS

Tariff paragraph: 753.

Commodity: Flower bulbs.

Rate of duty: \$1 to \$6 per thousand, *Equivalent ad valorem* (1939): 19%
or 15% ad val.

NOTE.—In the Tariff Act of 1930 certain kinds of flower bulbs were individually specified, with rates fixed at \$2 to \$6 per thousand; bulbs not so specified were made subject to a 30-percent ad valorem rate. Pursuant to the trade agreement with the Netherlands, effective February 1, 1936, the rate was reduced from \$6 to \$3 per thousand on tulip bulbs, from \$2 to \$1 per thousand on crocus corms, and from 30 per cent to 15 percent on "all other bulbs," etc.

GENERAL

Data on United States imports (which, for the kinds of bulbs that were imported, were nearly equal to the entire domestic consumption) for 1939 are given below:

Quantity (1,000 bulbs)	212, 415
Value (\$1,000)	13, 690
Unit value (per 1,000)	\$17. 38

¹ Foreign value.

Bulbs for the production of flowers are extensively used by florists as well as for bedding or general garden planting. The flowers, which are available in a large variety of colors and forms, are among

the most showy and beautiful. The number consumed in the United States runs into the hundreds of millions and their value to probably as much as 10 million dollars annually.

Before the war the greater part of several important kinds of bulbs used in this country, namely, tulips, hyacinths, easter lilies, and lilies-of-the-valley, were imported. Other important kinds, such as gladiolus, narcissus, and iris, were mostly produced in this country. The total imports were about 200 million bulbs annually, with a foreign value of approximately 3.5 million dollars. About one-half of this was represented by tulip bulbs alone. Most of the imports came from the Netherlands; France, the United Kingdom, Japan, and Germany also supplied substantial quantities.

Statistics of production of bulbs in the United States are not available. In the census of 1929, which was conducted by mail and is generally admitted to be inaccurate, sales of 235 million bulbs for 4.5 million dollars were reported. Production increased rapidly during the late 1930's and the first year or two of the 1940's, but it has declined considerably since that time because of shortage of labor. The lack of statistical information does not permit of any but general predictions with respect to domestic production or consumption.

POST-WAR SHORT TERM

In this period the demand for flower bulbs will probably be strong—stronger than in 1939 or than at present (1945). But probably little of this demand can be supplied by imports. From the meager information available regarding conditions in Netherlands bulb-growing districts, it appears doubtful that substantial quantities of bulbs will be available from that source; the United Kingdom probably will not have many bulbs to spare, and the rest of Europe, and Japan, none. It is doubtful that the kinds formerly imported in greatest volume and value, namely, the tulip, hyacinth, lily, and lily-of-the-valley, as well as some miscellaneous kinds, will be available from domestic sources in the quantities desired.

POST-WAR LONG TERM

Consumption, Production, and Imports

This country may not again depend as much as formerly upon imports for its supplies of bulbs, and imports of bulbs in the long-term period may not be as high as before the war. However, it may be expected that, owing to the nature of plant breeding and improvement and the life-long skill and knowledge of many foreign producers in this field, flower bulbs will be imported in substantial quantities primarily because of their special qualities.

The duty on bulbs amounted to approximately 19 percent ad valorem in 1939 and a 50-percent increase or decrease probably would not affect the volume of imports greatly. Substantial changes in consumer income probably would have more effect on prices and consumption than would be true of staple commodities.

Per capita income at 1939 level.

Duty as in 1939.—Imports might be about the same as in 1939, or around 200 million bulbs, with a foreign value, at prices as in 1939, of about 3.5 million dollars.

Duty reduced by 50 percent.—The imports might be 250–275 million bulbs, and the total foreign value, at 1939 prices, about 4.3–4.8 million dollars.

Duty increased by 50 percent.—Imports might not be more than about 150 million bulbs, with a foreign value, at the same prices as in 1939, of about 2.6 million dollars.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—With this high level of income it may be anticipated that the raising of flowers, particularly those from bulbs, will increase tremendously. Although the domestic production of bulbs may increase more than imports, the imports may be double those of 1939, or approximately 400 million bulbs. With a price (\$26 per 1,000) approximately 50 percent greater than 1939, the total foreign value would be in the neighborhood of 10 million dollars.

Duty reduced by 50 percent.—Imports might be as much as 500 million, and the foreign value, at the same price, approximately 13 million dollars.

Duty increased by 50 percent.—Imports might be somewhat smaller than with the duty as in 1939, perhaps 300 million bulbs, with a foreign value of 7.8 million dollars.

Exports

Exports of bulbs are not separately reported.

Employment

No information is available concerning employment in bulb production.

ORCHID PLANTS

Tariff paragraph: 754.

Commodity: Orchid plants.

Rate of duty: 15 percent ad valorem.

NOTE.—The Tariff Act of 1930 imposed the rate of 25 percent ad valorem which was reduced to 15 percent pursuant to the trade agreement with the United Kingdom, effective January 1, 1939.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 plants).....	66
Value (\$1,000).....	¹ 165
Unit value (per plant).....	\$2.51

¹ Foreign value.

Although more than 15,000 species of orchids are known, only a comparatively few species are of value for the commercial production of cut flowers. The species belonging to the *Cattleya* and *Laelia* families are generally considered the most useful and profitable of all commercial orchids. An interesting feature of orchid culture is the production of hybrids, several thousand of which are now recognized. *Cattleya* hybrids constitute most of the orchid flowers marketed. Because of the complexity and technical nature of their culture, orchids are ordinarily grown by specialists. Many of the establishments which produce orchids grow no other kinds of plants.

The United States has an important orchid industry; the value of the annual domestic production of orchid plants is probably 5 to 10

times that of imports. (Statistics of domestic production are not available.) Imports are largely supplementary to the domestic industry. They consist of 2 classes, cultivated and wild types. The wild types are obtained in the tropics by orchid hunters or collectors; most of the imports of this class have come from Venezuela and Colombia. The cultivated types, which are ordinarily more expensive than the wild, are mostly new or improved varieties or hybrids, and have come principally from the United Kingdom, where orchid culture is older, and perhaps farther advanced, than in the United States. The United Kingdom has always been the principal source of the imports, from the point of view of value, and imports from that source represented a much greater proportion of the total in 1941 and subsequent years than before.

Orchid plants may be imported only under special permits issued by the U. S. Department of Agriculture (Quarantine No. 37, promulgated under authority of the Plant Quarantine Act of 1912) "for the purpose of keeping the country supplied with new varieties and necessary propagating stock, or for any necessary experimental, educational, or scientific purpose." The holder of a permit is limited to 400 plants per year. The quarantine regulations do not constitute an effective barrier to importations. There have been two classes of importers: commercial orchid growers and private gardeners; many of the latter having very large and valuable collections. Imports, first separately reported in 1936, increased from 36,000, valued at \$124,000, in that year, to 143,000, valued at \$228,000, in 1941. In 1942 and 1943 the number imported dropped off sharply, and the value less sharply; but in 1944 the number imported rose sharply, and the value exceeded that of any previous year.

POST-WAR SHORT TERM

The importation of orchid plants in this period probably will be substantially higher than in 1939. Not only will the level of demand in the United States probably be high, but the United Kingdom probably will wish to export such items of its collections as can be spared. Collection in the jungles of tropical America also will probably be at a relatively higher level of activity than before the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

The cultivation and use of orchids tends to become much more prevalent as the national income reaches a high level, and as certain standards of culture are extended. Orchid flowers—and consequently the production and importation of orchid plants—as a luxury product may be expected to show a direct and distinct response to substantial changes in the per capita national income. Changes in the duty of 50 percent in either direction, however, probably would affect imports but little, and domestic production not at all.

Per capita income at 1939 level.

Considering imports during 1937-44, the trend in population, and the probable long-time upward trend in consumption, it appears likely that imports would be substantially higher than in 1939, possibly 100,000 plants, with a foreign value of perhaps \$250,000.

Per capita income 75 percent higher than in 1939.

Not only more but more valuable orchid plants probably would come in; imports might total 175,000 plants, with a total foreign value of around \$500,000. Domestic production also might increase considerably.

Exports

Exports of orchid plants, if any, are not separately reported.

Employment

Information regarding the number of employees in this industry is not available.

EDIBLE NUTS

Tariff paragraph: 756, 757, 759, 760, 761.

Commodity: Almonds, walnuts, pecans, filberts, Brazil nuts, cashews, pistachios, pignolias, chestnuts, peanuts, and nuts, n. s. p. f.

Rate of duty: (See table, p. 734.)

Equivalent ad valorem (1939):

See table, p. 734.)

NOTE.—The rates fixed in the Tariff Act of 1930 ranged from 13½ cents per pound on unshelled cream or Brazil nuts to 25 cents per pound on prepared or preserved chestnuts; ad valorem rates applied only to nut and kernel paste, not specially provided for (25%) and to prepared or preserved nuts not specially provided for (35%); crude chestnuts were duty-free. Duties were reduced 50 percent on prepared or preserved chestnuts, cream or Brazil nuts, shelled and unshelled, and pistachio nuts, shelled and unshelled, pursuant to trade agreements with France, effective June 15, 1935; Brazil, effective January 1, 1936; and Turkey, effective May 5, 1939. The rate on shelled filberts was reduced from 10 to 8 cents per pound pursuant to the Turkish agreement.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Edible nuts (shelled basis) ¹	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Tree nuts:						<i>Percent</i>
Quantity (1,000 pounds).....	108, 104	² 4, 300	103, 804	73, 641	177, 445	41. 5
Value (\$1,000).....	24, 945	² 1, 353	23, 592	³ 9, 316	22, 908	.....
Unit value (per pound).....	\$0. 231	\$0. 315	\$0. 242	\$0. 126		.....
Peanuts: ⁴						
Quantity (1,000 pounds).....	522, 196	750	521, 446	7, 108	528, 554	1. 3
Value (\$1,000).....	26, 901	73	26, 828	³ 357		.....
Unit value (per pound).....	\$0. 052	\$0. 097	\$0. 051	\$0. 050		.....
Total:						
Quantity (1,000 pounds).....	630, 300	² 5, 050	625, 250	80, 749	705, 999	11. 4
Value (\$1,000).....	51, 846	² 1, 426	50, 420	³ 9, 673	69, 093	.....

¹ Shelled nuts; unshelled nuts converted to shelled (nut meats) on the basis of the following percentages: Cashews, 22; walnuts and pecans, 39; almonds and filberts, 45; Brazil nuts, pistachios, and nuts, n. e. s., 50; pignolias, 60; peanuts, 66; chestnuts, 84.

² Walnuts and pecans only. Does not include 1,527 thousand pounds, valued at \$322,900, of "Other nuts," which group, however, includes desiccated coconut and other items not covered in this report.

³ Foreign value.

⁴ Peanuts used for edible purposes, excluding those pressed for oil.

The term "edible nuts" as used in this report includes peanuts and tree nuts, both shelled and unshelled.

In 1939 total consumption of peanuts for edible purposes amounted to 529 million pounds, or about 4 pounds per capita. This quantity represented an increase of about one-fifth during the interwar period, the increase being due to a considerable extent to the increased use of peanuts in the manufacture of peanut butter.

During the same period, consumption of tree nuts fluctuated around 1 pound per capita on a shelled basis. In 1939, total consumption on a shelled basis of tree nuts was 177 million pounds, or 1.3 pounds per capita.

Nearly two-thirds of the tree nuts and nine-tenths of the peanuts consumed in 1939 entered trade channels as shelled nuts. Probably more than three-fourths of the shelled tree nuts, and nearly all of the shelled peanuts were sold to the salting, baking, confectionery, peanut-butter, and ice cream industries. The peanut-butter industry consumed about 30 to 40 percent of all peanuts. Among the shelled tree nuts, cashews led in consumption, followed closely by pecans and walnuts; these three kinds accounted for nearly 75 percent of the shelled tree nuts consumed. Of the tree nuts sold unshelled, walnuts constituted nearly one-half, followed by Brazil nuts, pecans, and almonds.

In 1939, imports of tree nuts totaled 74 million pounds, shelled basis, with a foreign value of 9.3 million dollars (see table). Imports supplied 41.5 percent of consumption. The volume of imports in this year was only slightly greater than during the immediately preceding years. These imports of tree nuts, on a shelled basis, consisted predominantly of cashews, Brazil nuts, and chestnuts of kinds not produced domestically. Of the kinds of nuts which are produced domestically, four kinds, walnuts, almonds, pecans, and filberts, made up the bulk of imports in the early 1920's but constituted in 1939 only 12 percent of the total imports of tree nuts; and imports supplied less than 10 percent of the domestic consumption of these four kinds in that year. Of the imports of tree nuts in 1939, shelled nuts constituted nearly four-fifths, calculated on a shelled basis.

Edible nuts: United States imports and rates of duty, by kinds, calendar year 1939

Kind	Quantity (shelled basis)	For- eign value	Rates of duty 1939 ¹			Calculated duty, 1939	
			Un- shelled	Shelled	Blanched roasted ²	Total	Ad valorem
Tree nuts:							
Kinds produced in the United States:	1,000 pounds	1,000 dollars	Cents per pound	Cents per pound	Cents per pound	1,000 dollars	Percent
Almonds.....	1,597	433	5½	16½	18½	265	61.2
Walnuts.....	4,436	593	5	15	15	665	112.1
Pecans.....	214	41	5	10	10	21	62.6
Filberts.....	2,785	525	5	8	10	264	48.3
Subtotal.....	9,032	1,592				1,206	75.7
Kinds not produced in the United States:							
Brazil.....	21,076	2,252	¾	2½	2½	369	14.5
Cashews.....	29,466	4,089	2	2	2	589	14.6
Chestnuts.....	12,362	655	Free	Free	Free		
Pistachios.....	1,270	533	2½	5		41	7.7
Pignolias.....	231	85	2½	5		14	16.7
Nuts, n. e. s.....	214	60	2½	5	35% ad v.	10	17.2
Subtotal.....	64,609	7,724				1,043	14.8
Total, tree nuts.....	73,641	9,316				2,249	26.0
Peanuts:							
Free (Philippines).....	6,406	833					
Dutiable.....	702	24	4½	7	7	48	200.0
Total, peanuts.....	7,108	357				48	200.0
Grand total.....	80,749	9,673				2,296	22.7

¹ These rates of duty are also those of the Tariff Act of 1930, with the exception of Brazil nuts, on which the duty in the Tariff Act of 1930 was 1½ cents per pound on the unshelled and 4½ cents per pound on the shelled, and of shelled filberts on which the duty was 10 cents per pound.

² Includes blanched, roasted, salted, or otherwise prepared or preserved, exclusive of nut pastes.

³ On dutiable items only.

In 1939 the average ad valorem equivalent of the duty paid on the types of the tree nuts produced domestically was 57.5 percent on the unshelled and 77.6 percent on the shelled nuts. On the types of dutiable tree nuts not produced commercially in this country, the average ad valorem equivalent of the duty paid was 14.1 percent on the unshelled and 14.9 percent on the shelled nuts.

The Mediterranean countries were the principal source of United States imports of almonds, filberts, pistachios, chestnuts, and pignolia nuts. China was the principal supplier of walnuts, Brazil of Brazil nuts, and British India of cashews.

Imports of peanuts in 1939 amounted to 7 million pounds, shelled basis, and had a foreign value of \$355,000, supplying only a little over 1 percent of consumption. These imports consisted predominantly of shelled peanuts imported duty-free from the Philippine Islands. Dutiable imports of peanuts were chiefly from China, and on them the ad valorem equivalent of the duty paid in 1939 was 141.5 percent on the unshelled and 257.3 percent on the shelled peanuts.

Peanuts cleaned and sold for edible purposes were grown on nearly 2 million acres in 1939, with a farm production of 800 million pounds, unshelled, or 522 million pounds, edible shelled basis, and a farm value of 27 million dollars. In 1939, commercial tree-nut orchards in the United States covered approximately 450,000 acres, with 47 percent in walnuts, 32 percent in improved pecans, 19 percent in almonds, and 2 percent in filberts. Most of the commercial walnut, almond, and filbert orchards are in the Pacific Coast States; pecans and peanuts are grown in several of the Southeastern and South Central States. The aggregate farm production of the four kinds of tree nuts mentioned, including seedling pecans, was 270 million pounds, unshelled, or 108 million pounds on a shelled basis, with a farm value of 25 million dollars.¹

POST-WAR SHORT TERM

Total consumption of edible tree nuts and peanuts may amount to somewhat over 700 million pounds (shelled basis). Peanuts may supply a larger proportion of the total than in 1939, because of the increasing use in making peanut butter, and because imports of tree nuts will probably be smaller than before the war because of the adverse effects of the war on the nut industries of some of the major foreign suppliers.

POST-WAR LONG TERM

Consumption, Production, and Imports

Assuming, as is done in the estimates made below, that imports of peanuts from the Philippine Islands, the chief source in 1939, become dutiable, as provided for in the Philippine Independence Act, total imports of peanuts will probably be small under all the assumed levels of national income and rates of duty. If this assumption should prove to be incorrect imports of peanuts might supply somewhat over 1 percent of consumption.

Total domestic production of tree nuts might attain a level of about 135 million pounds, shelled basis, the increased production

¹ The aggregate production of many other tree nuts such as pineas (American pignolias), black walnuts, and butternuts, though fairly large in certain years, is not important commercially, as these are consumed chiefly in the communities where grown and gathered.

over 1939 resulting from new orchards coming into bearing and young bearing orchards attaining full bearing age. Changes in the weather and the fact that nut trees which bear heavily in one year often bear only a light crop in the next, result in annual variations in production; the estimated volume of production is, therefore, an average. Orchard development is a long-time operation, the time between the planting of trees and their bearing a crop being on the average 10 to 12 years. Thus, the domestic production in quantity would vary only slightly with the different assumed levels of income and of rates of duty, and the principal variation is in the value of the crop. Changes in rates of duty might affect domestic prices and the total value of one kind more than of another.

Per capita income at 1939 level.

Regardless of the assumption as to duty, consumption of peanuts may be around 600 million pounds, taking into account a 5-percent increase in per capita consumption and a 10-percent increase in population. Also regardless of the assumption as to duty, domestic production of peanuts for the domestic market would probably supply practically the entire United States demand and approximate 600 million pounds valued at about 31 million dollars.

Duty as in 1939.—Consumption of tree nuts might be about 200 million pounds. Imports of the kinds produced in the United States would probably be less than in 1939 but total quantity of imports of all types of tree nuts might not be much less than in 1939 and might approximate 70 million pounds, with a total foreign value of about 8½ million dollars. Imports would thus supply about 35 percent of consumption. Production of tree nuts for the domestic market might amount to about 130 million pounds, with a value of about 29 million dollars.

Duty reduced by 50 percent.—Consumption of tree nuts might be about 210 million pounds. Total imports of almonds, walnuts, and filberts might increase appreciably, but the imports of other types, constituting about 85 percent of the total tree-nut imports in 1939, would probably increase only to a minor extent. Aggregate imports of tree nuts thus might supply about 40 percent of consumption and amount to about 82 million pounds, with a total foreign value of about 11½ million dollars. Production for the domestic market might be about 128 million pounds, with a value of about 25.5 million dollars.

Duty increased by 50 percent.—Consumption of tree nuts might be about 190 million pounds. Imports of the four kinds produced in the United States would be negligible but imports of the other kinds, principally cashews and Brazils, might not decline much in volume, as the higher duty would not eliminate their favorable price relationship to other tree nuts. The aggregate imports of all tree nuts might supply about 30 percent of consumption, and amount to 58 million pounds, with a foreign value of possibly 7 million dollars. Production for the domestic market might be about 132 million pounds with a value of about 47 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of peanuts in edible uses might rise to 5 pounds, shelled basis, per capita, or to a total of about 700 million pounds,

almost all of which would be supplied by domestic production under any of the assumptions as to duty. With prices possibly 50 percent higher than in 1939, the total value of peanut production for such uses might approximate 52 million dollars.

Since domestic production of tree nuts cannot be materially increased except by developing new trees which require 10 to 12 years to be of bearing age, it is assumed that total production of tree nuts at the higher level of income around 1953 would be about 135 million pounds, shelled basis, the same as at the lower level of income. Farm prices at this higher level of income might be as much as 50 percent higher than at the lower level. In 15 to 20 years, however, at continued high prices, more trees will probably have been planted and production will be likely to increase considerably.

Duty as in 1939.—Consumption of tree nuts might be about 230 million pounds. Imports might supply about 41 percent of consumption and amount to approximately 95 million pounds, with a foreign value of about 18 million dollars. The bulk of such imports would probably consist of cashews, Brazil nuts, and chestnuts, with relatively small quantities of the domestic types of nuts. Production for the domestic market might be about 135 million pounds, with a value of about 44 million dollars.

Duty reduced by 50 percent.—Consumption of tree nuts might be about 240 million pounds. Total imports of the kinds produced domestically might be expected to increase, but because of higher prices at this level of income the reduction of the specific rates of duty would be proportionately less significant, and the aggregate imports of tree nuts might supply 45 percent of consumption and amount to about 110 million pounds, with a foreign value of, say, 22 million dollars. Production for the domestic market would then be about 130 million pounds and at slightly lower prices, have a value of possibly 39 million dollars.

Duty increased by 50 percent.—Consumption of tree nuts might be about 220 million pounds. Higher domestic prices of tree nuts might be expected to neutralize to a certain extent the effect of such a change on imports; and aggregate imports might supply about 38 percent of consumption and approximate 85 million pounds, with a foreign value of about 14½ million dollars. These imports of tree nuts would probably consist almost exclusively of the nondomestic kinds. Production for the domestic market would amount to 135 million pounds and, with higher prices prevailing, have a total value of about 47 million dollars.

Exports

Exports of peanuts in 1939, consisting largely of high-quality shelled nuts, totaled 750,000 pounds, valued at \$73,000, and constituted less than 0.2 of 1 percent of total domestic production. These exports went principally to Cuba and Canada. Exports of peanuts in the post-war long term will probably continue to be very small.

Exports of tree nuts have consisted primarily of walnuts and pecans. In 1939 exports of these two kinds totaled approximately 4.3 million pounds on a shelled basis, or less than 5 percent of United States production of tree nuts. Most of these exports were made under a system

of Government subsidy payments, which in 1939 equaled 5.5 percent ad valorem on the gross value of the exports of walnuts and pecans. The outstanding markets for United States exports of edible tree nuts were the United Kingdom and Canada.

In the long-term period, with per capita income remaining at the 1939 level, there might again be a domestic surplus of edible tree nuts. The export of such nuts in appreciable quantities might depend upon the adoption of some form of export subsidy, which was the established practice in the immediate pre-war period. If subsidies are continued, it may be expected that exports of tree nuts will continue in value during post-war period in somewhat the same relation to domestic production as in 1939, and will be within the range of 3-7 million pounds, depending on the assumed rate of duty. At the assumed higher level of national income, exports will probably be negligible because of the increased domestic consumption, with fairly static production, except at the assumed lower rate of duty, when 5 million pounds might possibly be exported.

Employment

The production of tree nuts or of peanuts is frequently one of several activities on farms producing these crops. Laborers are thus only intermittently engaged in the production and harvesting of the nuts but on the basis of the average number of man-days required to produce and harvest an acre, it is estimated that in 1939 approximately 60,000 laborers (annual basis of 300 days) were required to produce and harvest the domestic walnut, almond, pecan, filbert, and peanut crops for edible purposes. Similarly, it is estimated that about 80,000 laborers would be required to produce the larger crop indicated under the post-war assumptions of increased duty at the higher national income level.

COCONUTS

<i>Tariff para- graph</i>	<i>Commodity</i>	<i>Rate of duty</i>	<i>Equivalent ad valorem (1939)</i>
758	Coconuts, whole, and shredded desiccated coconut:		
	Whole	1/4¢ each	17%
	Desiccated meat	3 1/2¢ per lb.	108%
	From Philippine Islands	Free.	

NOTE.—The rate of duty on whole coconuts under the Tariff Act of 1930 was 1/4 cent each and was reduced to 1/4 cent each under the trade agreement with the United Kingdom, effective January 1, 1939. The rate of 3 1/2 cents per pound on desiccated meat was in effect from 1922 until December 21, 1944, when the duties on whole coconuts and coconut meat were suspended by Public Law 504 of the 78th Congress for the period of the unlimited national emergency.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports ¹	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export	For domestic market			
Quantity (equivalent desiccated ² , 1,000 pounds).....	3,952	(*)	3,952	96,618	100,570	Percent 96
Value (\$1,000).....	277		277	4,815		
Unit value (cents per pound).....	7.0		7.0	5.0		
Persons employed (number).....	(*)					

¹ Principally production in Puerto Rico as indicated by shipments to and processed in continental United States.

² Imports were as follows:

Commodity	Quantity (1,000 pounds)	Foreign value (thousands)	Unit value (cents per pound)
Desiccated, from Philippines (duty-free).....	96,260	\$4,400	4.9
Desiccated, from other countries.....	336	11	3.3
Whole (28,066,000 nuts), equivalent desiccated.....	7,022	404	5.8
Total or average.....	96,618	4,815	5.0

¹ Whole coconuts converted to equivalent quantity desiccated meat, assuming four nuts yield 1 pound of desiccated meat.

² Negligible.

³ Foreign value.

⁴ See under employment.

Shredded desiccated coconut differs from copra, of which large quantities are imported for the production of coconut oil, in that it is shredded and dried under sanitary conditions for edible purposes, whereas copra is dried in a crude manner in irregular pieces. Shredded coconut is the form in which practically all of the coconut meat consumed as food in the United States is sold. The principal outlets are the confectionery and baking industries.

Our immediate pre-war consumption of shredded coconut was about 100 million pounds annually. Ninety percent of the supply was obtained from the Philippine Islands in the form of desiccated meat. The rest was produced in this country by processing whole coconuts obtained principally from Puerto Rico, Jamaica, and other Caribbean countries and relatively negligible quantities from Florida.¹ In the early 1920's, 1923 for instance, Ceylon supplied 80 percent of the United States imports of desiccated coconut and the Philippines 20 percent.² The Philippine desiccating industry developed rapidly under the 3½-cents-per-pound duty provided for in the Tariff Act of 1922 on imports from other countries. Philippine shipments had risen to 89 percent and Ceylon's had declined to 11 percent of the total imports by 1930. In 1939 nearly all of the imports came from the

¹ A small proportion of the whole nuts imported is consumed without commercial shredding.

² Under the Tariff Act of 1913 the tariff rate had been 2 cents a pound.

Philippine Islands. During the 1920's about 30 percent of imports of the edible coconut products (in equivalent desiccated) came in as whole coconuts, but by 1939 less than 10 percent were entered as whole coconuts, the imports of desiccated meat having increased.

The principal coconut surplus-producing areas are the Netherlands East Indies, Philippine Islands, Ceylon, and South Sea Islands, which are too distant for economical shipment of whole coconuts to the United States. Whole coconuts are shipped from the Caribbean producing areas but these supplies would probably be insufficient to furnish even half of the United States peacetime requirements. Maximum domestic production (Puerto Rico) would probably not supply more than 5 or 6 percent of domestic requirements.

Thus, in the discussion of post-war supplies of desiccated coconut, it is assumed that an important part of the United States consumption will probably have to be supplied by the more distant Pacific areas in the desiccated form unless the greatly restricted use of this product during the war is to continue. Also, it is assumed that the Philippine Islands will have attained their independence and that, according to the provisions of the Philippine Independence Act, products coming from the Philippines to the United States will be subject to full duties. If, in the meantime, however, arrangements were made giving more favorable tariff treatment to Philippine products, the estimates made below would need substantial revision.

POST-WAR SHORT TERM

The demand for desiccated coconut is likely to exceed appreciably that in 1939. It seems likely that the output of confectionery and bakery products, the principal commercial outlets for desiccated coconut, should increase possibly 20 percent over that in 1939 and the consumption of desiccated coconut, if available, increase in somewhat the same proportion. A large part of the supply, almost wholly imported, would probably have to come from the distant Pacific areas—Philippine Islands, Ceylon, and Netherlands East Indies—and in the desiccated form. In order to attract sufficient imports from these sources, if desiccated coconuts from the Philippines should be dutiable at this time, the United States price would have to increase to the extent of absorbing a considerable part of the duty because United States production is virtually limited to Puerto Rico, and is, on the record of production during the interwar period, not likely to increase materially over the 1939 output level.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Domestic production, principally Puerto Rican production, is not likely to expand beyond 5 million pounds, that is, 25 percent over 1939, even in response to substantially higher prices. In the following discussion it is assumed that domestic production will total about 5 million pounds regardless of the assumed levels of income and assumed rates of duty. Should the Philippine product be dutiable in the post-war period, the United States price will have to increase sufficiently to absorb a considerable part of the duty if the pre-war consumption

rate is to be approached. The Caribbean supply is limited and the only other major foreign sources, Ceylon and the Netherlands East Indies, probably could not supply substantial quantities at much lower prices than the Philippine producer.

Duty as in 1939.—Should imports from the Philippines be dutiable, necessitating appreciably higher prices in the United States in order to permit imports, consumption might be about 85 million pounds, a 10-percent decline in per capita consumption. Domestic production would be about 5 million pounds (in terms of desiccated coconut), valued at about one-half million dollars. Imports, including whole coconuts and desiccated meat, might be 80 million pounds, with a foreign value of possibly 3.5 million dollars, representing a decline in average foreign unit value of about 10 percent.

Duty reduced by 50 percent.—This reduction would probably be reflected in part in higher prices to foreign producers and in part in lower prices to domestic consumers, and result in increased consumption and a corresponding increase in imports. Per capita consumption may be about 15 percent less than that of 1939, or a total consumption of about 95 million pounds. Domestic production would remain unchanged at about 5 million pounds, valued at, say, slightly under one-half million dollars. Imports might approximate 90 million pounds, with a foreign value of possibly 4.5 million dollars, about 10 percent less than the value of imports in 1939.

Duty increased by 50 percent.—Recognizing that imports constitute the predominant part of the United States supply of coconut meat, such an increase in the duty might reduce consumption to possibly 75 million pounds and imports to 70 million, with a foreign value of about 3 million dollars. The high domestic price necessary to attract imports would presumably retard domestic consumption. Domestic production would probably be maintained at the relatively high level of 5 million pounds, valued at about 550,000 dollars.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—At this high level of income and with the general level of prices correspondingly higher, the 1939 rate of duty would represent a smaller proportion of the landed United States price of coconut meat. United States prices would probably be double those prevailing in 1939 and it is estimated consumption might equal 105 million pounds, of which possibly 100 million pounds would consist of imports having a foreign value of about 9 million dollars. Domestic production might be about 5 million pounds, valued at about 750,000 dollars.

Duty reduced by 50 percent.—Imports would increase appreciably and this should tend to lower the price to United States consumers. Imports might be equivalent to as much as 110 million pounds of desiccated product, with a foreign value in the neighborhood of 11 million dollars. Domestic production might still be about 5 million pounds, valued at slightly more than two-thirds of a million dollars. Consumption thus might approximate 115 million pounds.

Duty increased by 50 percent.—Domestic consumption would likely be considerably depressed and might not exceed 95 million pounds. Imports might amount to 90 million pounds, with a foreign value of possibly 7.2 million dollars. Domestic production would probably be at its assumed maximum level of about 5 million pounds valued at approximately 800,000 dollars.

Exports

Data on United States exports of whole coconuts and coconut meat are not reported separately, but it is known that such exports have been negligible and it may be assumed they will continue to be so.

Employment

On the basis of the trend of the Puerto Rican production of coconuts during the 1920's and 1930's, it may be assumed that the United States acreage in coconuts will probably not be greatly expanded. Since it is not an intensive crop, labor requirements per acre are small compared to those for tobacco, sugarcane, and vegetables, which are also grown in Puerto Rico. The domestic coconut desiccating industry probably did not employ much in excess of 1,000 persons regularly in 1939. If the imports of desiccated meat from the Philippines should become dutiable or the duty should be increased, the probable maximum employment in the domestic desiccating industry would be about 2,000 persons.

ALFALFA, CLOVER, AND VETCH SEEDS

Tariff paragraph: 763.

Commodity: Alfalfa, clover, and vetch seeds.

Rates of duty: 1½¢, 2¢, 3¢, 4¢, and 6¢ per lb. Equivalent ad valorem (1939): 21 percent to 74 percent (average 36 percent).

NOTE.—The rate on alfalfa and alsike clover seeds was reduced from 8 to 4 cents per pound and that on sweetclover seed from 4 to 2 cents per pound under the trade agreements with Canada, effective January 1, 1936, and January 1, 1939. The rate on red-clover seed was reduced from 8 to 5 cents per pound under the agreement with France, effective June 15, 1936, and was further reduced to 4 cents pursuant to agreement with Canada, effective January 1, 1939. The rate on crimson-clover seed remains unchanged at 2 cents per pound and that on white- and ladino-clover seeds at 6 cents per pound. Clover seed not specially provided for was reduced from 3 to 2 cents per pound under the agreement with the United Kingdom, effective January 1, 1939. The rates on vetch seeds remain unchanged at 1½ or 3 cents per pound.

GENERAL

Data on United States production, imports, and consumption for 1939 and the 1936-39 average are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
1939						
Quantity (1,000 pounds).....	326,649	1,162	325,487	21,987	347,394	Percent 6.3
Value (\$1,000).....	152,264	216	152,048	1,730		
Unit value (cents per pound).....	16.0	18.6	16.0	7.9		
1936-39, average						
Quantity (1,000 pounds).....	261,968	1,518	260,470	29,345	279,815	10.5
Value (\$1,000).....	150,398	340	150,094	2,706		
Unit value (cents per pound).....	20.0	22.4	20.0	9.0		

1 Estimated.
2 Foreign value.

With the exception of white clover seed, which is used primarily for seeding lawns, all the seeds herein considered¹ are used almost entirely for the production of farm crops—for hay, pasture, ground cover, and green manure. These crops are extremely important in American agriculture, both from the point of view of production, and also from that of soil conservation and maintenance.

The United States production of these seeds usually supplies around 90 percent of United States consumption. Several of these crops, however, are uncertain, the production of a profitable seed crop depending to an important extent on the weather during the time of blooming as well as during the period of maturing and at harvest. As a consequence the output of the individual kinds may vary widely from one year to another, and sometimes a short crop of two or more kinds occurs in the same season. Imports and exports may vary with the domestic output. There is, in addition, a small, regular, north-south border trade between the United States and Canada and the United States and Mexico in several of these seeds, as there is some demand for northern-grown seeds because of their hardiness.

Experiments conducted by the U. S. Department of Agriculture and State agricultural experiment stations have indicated that alfalfa and red clover seed from certain foreign regions is unsuitable for general agricultural use in the United States because of lack of hardiness in areas of low winter temperatures, poor productivity, or susceptibility to disease. This is true of alfalfa seed grown in Turkestan, Africa, and South America, and red clover grown in Italy. Alfalfa and red clover seed coming from those regions (or from unknown sources) is required to be stained red for identification. Such stains distinguish definitely seeds from those areas and as a result their prices tend to be lower and imports less than they might be otherwise.

Supplies of these seeds during the war years have been relatively short. Production during 1941-43 has been substantially lower than in 1939 and 1940. Imports during 1940-44 have been only about 25 percent as high, on the basis of quantity, or only about 40 percent as high on the basis of value, as during 1936-39. Most of the principal sources of imports before the war, Canada, Hungary, Rumania, France, and Poland-Danzig, have been cut off by the war.

The seeds included in this group vary widely in price, not only between one another but also from year to year with respect to the individual kinds. Although the rates of duty vary greatly in absolute amount, they vary less in proportion to the average value of the individual kinds. In 1939 the ad valorem equivalents of the duties varied as follows: alfalfa, 25 percent; red clover, 52 percent; alsike clover, 31 percent; crimson clover, 29 percent; sweet clover, 73 percent; white and ladino clover, 21 percent; clover not specially provided for, 29 percent; hairy vetch, 74 percent; and other vetch, 68 percent. It is obvious that changes of 50 percent in the duties in either direction would be likely to have different effects upon the different kinds of seeds. In the estimates which follow, an attempt has been made to forecast the probable influence of the assumed conditions on the group as a whole.

The year 1939 was not a normal or typical one in the production of these seeds or trade in them; production was high and imports

¹ Alfalfa, red clover, alsike clover, crimson clover, sweetclover, white and ladino clover, other clover, hairy vetch, and other vetch.

were lower than in 1936-38. As for exports, they have varied so widely from one year to another that it is difficult to select a representative one. In the estimates which follow an attempt has been made to allow for the fact that 1939 was not a typical year.

POST-WAR SHORT TERM

In the short term, as at present (1945), there may be considerable difficulty in obtaining adequate supplies. Domestic production may be slightly more than in 1939, but imports may not be more than half as much as in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

With the growing interest in grassland farming for our basic livestock and dairy agriculture and in soil conservation and improvement, the consumption of legume-forage seeds seems likely to increase gradually. In the post-war long term, as before the war, domestic production will probably supply at least 90 percent of consumption. Imports will probably again be in part fortuitous, depending upon the size of the domestic crops, and in part regular imports of hardy northern-grown seeds which command relatively high prices.

Per capita income at 1939 level.

Duty as in 1939.—Consumption might be somewhat higher than in 1939, or perhaps 350 million pounds. Production for the domestic market might amount to about 320 million pounds, valued, at the estimated average price for 1936-39, at about 64 million dollars; and imports 30 million pounds, with a foreign value, at the same unit value as during 1936-39, of about 2.7 million dollars.

Duty reduced by 50 percent.—Consumption might be 360 million pounds, 320 million supplied by domestic production for the domestic market, and 40 million by imports. At the average unit value estimated for 1936-39, the production would have a value of about 64 million dollars. The imports probably would not have a foreign value of more than 8 cents per pound, or a total foreign value of more than about 3.2 million dollars.

Duty increased by 50 percent.—Consumption might be about 350 million pounds, of which about 335 million might be supplied by domestic production and about 15 million by imports. At the average estimated unit value for 1936-39 the domestic production might have a value of about 67 million dollars, while the imports, because they probably would consist mostly of higher priced seeds, would have a foreign value of perhaps 12 cents per pound, or a total foreign value of perhaps 1.8 million dollars.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Consumption at this level of income might be about 15 percent higher than at the lower-income level, or about 400 million pounds annually. Domestic production for the domestic market might supply around 365 million of this, and imports, 35 million. Assuming unit values about 25 percent higher than those used in the estimates for the lower-income level, the domestic production might have a total value of about 87.6 million dollars. The

foreign unit value of imports under these conditions might be as much as 12 cents per pound, making the total foreign value about 4.2 million dollars.

Duty decreased by 50 percent.—Consumption might be around 410 million pounds annually, 365 million pounds supplied by domestic production and 45 million by imports. At 24 cents per pound, which is 25 percent higher than the estimated average unit value for 1936–39, the total value of such production for domestic consumption would be about 87.6 million dollars. The foreign value of the imports probably would not exceed 11 cents per pound, or a total of about 5 million dollars.

Duty increased by 50 percent.—Total consumption might be in the neighborhood of 400 million pounds, of which domestic production might supply perhaps 380 million and imports 20 million. At 24 cents per pound domestic production would be valued at about 91 million dollars. The foreign unit value of the imports at this level of duty might be as high as 13 cents per pound, thus making the total foreign value of the imports 3 million dollars.

Exports

Exports have not been large, and are not likely to be large in the future.

Employment

Data on employment in the production of these seeds are not available.

GRASS SEEDS

Tariff paragraph: 763.

Commodity: Grass seeds.¹

Rates of duty: From 1¢ to 20¢ per lb. Equivalent ad valorem: (1939) 6% to 77%, average 14%.

NOTE.—Under one or both of the trade agreements with Canada, effective January 1, 1936, and January 1, 1939, rates of duty on grass seeds fixed in the Tariff Act of 1930 have been reduced as follows: Bentgrass, from 40 to 20 cents per pound; bluegrass, from 5 to 2½ cents per pound; timothy, wheatgrass, and bromegrass, from 2 to 1 cent per pound. Under the agreement with the United Kingdom, the rate on ryegrass was reduced from 3 to 1½ cents per pound, effective January 1, 1939. The rates imposed by the Tariff Act of 1930 on other grass seeds remain effective as follows: Tall oatgrass and orchard grass, 5 cents per pound; millet, 1 cent per pound; fescue and other grass seeds not specially provided for, 2 cents per pound.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	133,566	16,566	117,010	9,887	126,897	Percent 7.8
Value (\$1,000).....	18,014	1,253	17,021	1,319		
Unit value (cents per pound).....	16.0	7.6	16.0	13.3		

¹ Estimated.
² Foreign value.

¹ Bentgrass, Canada bluegrass, Kentucky bluegrass, tall oatgrass, ryegrass, orchard grass, meadow fescue, chewings fescue, other fescue, millet, timothy, bromegrass, wheatgrass, and grass seeds not specially provided for.

Within the last decade or so the use of grass crops in American agriculture has assumed much greater importance even than formerly, because of more concern about conservation and improvement of the soil, and more emphasis by Government agencies upon official programs to that end. The grasses of which the seeds are included in the group covered in this report are all used in actual farming; Kentucky bluegrass and bentgrass are no exceptions, even though the commercial seed supply of these two items is used mostly for seeding lawns in cities, towns, and villages.

The United States supplies nearly all of its own requirements of these seeds as well as some for export—in 1939 exports equaled 12 percent of production. Imports in 1939 were 8 percent of the apparent domestic consumption. The import trade is mostly fortuitous, supplementing short domestic supplies caused by crop failure or low yields. Following a year of general drought in the United States, the total imports in 1935 amounted to 36 million pounds; but during 1936–41 imports were fairly uniform at about 7–9 million pounds annually. In 1939 the imports were somewhat higher, in both quantity and value, than the average of the immediate pre-war years. During 1943 and 1944 imports were greater even than in 1939. For the most part the kinds imported are not exported, and vice versa. Timothy seed is one of the principal export items.

Canada has been the principal source of imports, and New Zealand and Australia probably second and third; the United Kingdom, Denmark, Argentina, Hungary, and Brazil also supplied substantial quantities in 1939.

POST-WAR SHORT TERM

The current upward trend in the consumption of grass seeds in the United States seems likely to continue in the short term. Then, as now (1945), other crops may generally be more profitable than grass seed crops and the domestic production may thus not exceed 175 million pounds, which is about 8 percent higher than in 1944, and nearly 30 percent higher than in 1939. As domestic production probably will still be, as now, relatively short compared with demand, imports might be as much as 50 percent higher than in 1939, or about 15 million pounds, 3 million pounds more than in 1942.

POST-WAR LONG TERM

Consumption, Production, and Imports

The consumption of grass seeds is relatively inelastic. Within the narrow range in price changes which would result from an increase or decrease in the duty of 50 percent, farmers would not be likely to sow much more or less seed at the low than at the high duty level. Neither does it appear likely that the consumption of these seeds would be more than 10 or 15 percent higher at the high level of national income than at the low. Furthermore, if more imported seeds were used, probably a correspondingly smaller quantity of domestic seeds would be sown in this country. But the conditions stimulating imports might also stimulate exports (exports usually consisting of different kinds), so that domestic production might not decline because of higher imports.

Five of the 13 classifications here considered—brome grass, chewings fescue, wheatgrass, ryegrass, and grass seeds, n. s. p. f.—accounted for 86 percent of total imports in 1939, both by quantity and by value. On ryegrass the duty was equivalent to 23 percent ad valorem, but on the four others the equivalents were only 6.5 to 13 percent. Changes of these low rates, even by 50 percent, would probably not have pronounced effects. The duties on the other seeds run at about the same level, except on bentgrass, 77 percent, and on orchard grass and millet, 54 percent and 56 percent ad valorem, on the basis of 1939 imports. Imports of these three would presumably respond to 50 percent changes in duties; but the three constituted in 1939 only 10.5 percent of the total quantity of imports and 7-percent of the total value.

Per capita income at 1939 level.

Consumption might be about 15 percent higher than in 1939, or about 145 million pounds. Total production might amount to about 153 million pounds, and production for the domestic market to about 133 million pounds. At the unit value estimated for 1939, 6 cents per pound, the total production would thus be valued at about 9.7 million dollars, and production for the domestic market at about 8 million dollars. Although imports and exports would probably vary by 2-3 million pounds at different assumed duty-levels, these variations would be likely to be in the same direction—i. e., higher imports and higher exports or lower imports and lower exports—according to the duty status, so that consumption probably would be about the same under the several levels of duty contemplated.

Imports, with no change in duties, might be about 12 million pounds, with a foreign value, at unit prices as of 1939, of approximately 1.8 million dollars. With rates of duty 50 percent lower, the quantity imported might be 13 million pounds, and the foreign value about 1.7 million dollars. With rates of duty 50 percent higher, the quantity imported might be 10 million pounds, and the foreign value approximately 1.3 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption and domestic production might be about 10 percent higher than under the 1939 income level, or possibly about 160 million pounds for consumption, 170 million for total production, and 145 million for production for the domestic market. At an estimated unit value of 8 cents per pound, total production would thus be valued at about 13.6 million dollars, and production for the domestic market at about 11.6 million dollars.

With no change in duties imports might be about 15 million pounds, which, at unit values about 25 percent higher than in 1939, would have a foreign value of about 2.5 million dollars. With the rates decreased 50 percent, imports probably would be a little more—or about 16 million pounds, with a foreign value of about 2.7 million dollars; and with the rates increased 50 percent they would probably be a little less—say 13 million pounds, with a foreign value of about 2.2 million dollars.

Exports

The United States has had for many years a considerable export trade in grass seed. The exports increased from 8.4 million pounds in 1936 to 23.8 million pounds in 1941, dropped to 17.4 million in 1942,

and increased to 27.1 million pounds in 1943. Prior to the war the principal markets were Canada and Europe; during the war Canada, the United Kingdom, and the Soviet Union have taken most of the exports.

At the lower level of income, exports might be about 20 million pounds annually, valued, at unit values as of 1939, at approximately 1.5 million dollars. At the higher level of income they might amount to around 25 million pounds, which, at unit values about 25 percent higher than in 1939, would be worth approximately 2.4 million dollars.

Employment

Data regarding employment in the production of grass seeds are not available.

VEGETABLE SEEDS

Tariff paragraph: 764.

Commodity: Vegetable seeds.

Rate of duty: $\frac{1}{2}$ ¢ to 25¢ per lb.

Equivalent ad valorem (1939): 3.7%–61.1%. Average 15%.

NOTE.—The rates on numerous vegetable seeds have been reduced 25 to 50 percent pursuant to the trade agreements with the Netherlands, effective February 1, 1936, and the United Kingdom, effective January 1, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports ¹	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	8,565	2,309	6,556	5,029	11,585	Percent 43
Value (\$1,000).....	\$2,362	723	\$1,639	1,698		
Unit value (cents per pound).....	26.7	31.3	25.0	13.9		

¹ Average annual imports for 1935-39, 6,400,000 pounds with value of \$917,000.

² Estimated.

³ Foreign value.

Except for seed beans, peas, potatoes, and sweet corn, this report covers the seed of practically all vegetables grown commercially and in home gardens. The production and marketing of vegetable seed in the United States is an important and distinct industry.

The production of commercial vegetables, and hence the consumption of vegetable seed, has been increasing at the rate of about 2 percent a year for the last three decades. This long-term trend is probably due to the increase in population and the increased emphasis upon vegetables in the diet. Since 1939 consumption has increased even more rapidly, reflecting the increased demand for vegetables at home and for shipment in dehydrated form to our armed forces abroad and to our allies. The apparent consumption of vegetable seeds, which was 11.6 million pounds in 1939, had increased to 23.4 million pounds in 1944. This extraordinary consumption may be expected to be largely temporary, but the long-term upward trend may be expected to continue after the war.

The production of vegetable seeds in the United States is largely in the hands of a relatively few firms. Production is for the most part in localized areas, especially in California and Washington, but also in Idaho, Colorado, Michigan, New York, and Connecticut.

United States production has increased from about 8.9 million pounds in 1939, about 75 percent of United States consumption, to about 32.4 million pounds in 1944, about 140 percent of consumption. Exports have risen to much in excess of imports. The United States has become practically the only source of commercial vegetable seed in the world.

United States imports of seeds were about 43 percent of apparent consumption in 1939. Imports were relatively higher for some kinds, such as spinach seed, than for others. The principal sources of imports of vegetable seeds as a group were the Netherlands and France. With former European sources shut off by the war, importation has virtually ceased. The prolonged interruption to this trade may make it difficult for European exporters to regain their former United States markets, but it may be expected that they will be able to sell us the seed of certain vegetables, where they produce superior strains, or at substantially lower cost.

POST-WAR SHORT TERM

The world demand for vegetable seeds is likely to be substantially lower than it was in 1944, but much larger than it was in 1939. Most of that demand will probably have to be supplied by the United States, as in this period the former important producing and exporting regions in France, Denmark, the Netherlands, and Germany probably will not have had time to again become factors in international trade.

Production in the United States may be about 20 million pounds, somewhat more than double that in 1939. Exports will probably be at least 4 million pounds, about 75 percent higher than in 1939. Imports may be a million pounds, one-fifth the quantity imported in 1939. This quantity would make the apparent consumption about 17 million pounds, which is nearly 50 percent higher than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

The upward trend in vegetable consumption probably will continue in the long-term post-war period, although perhaps at a more moderate rate of increase than before the war.

Per capita income at 1939 level.

At this level of income the consumption of vegetable seeds might be about 30 percent higher than in 1939, or about 15 million pounds, depending in part on the assumed rate of duty.

Duty as in 1939.—Imports might be about 13–17 percent of consumption, or about 2.0–2.5 million pounds, with a foreign value, at 1939 prices, of \$280,000–\$350,000. United States production for the domestic market might be about 12.5–13 million pounds, valued at 25 cents a pound, or about 3.1–3.2 million dollars.

Duty reduced by 50 percent.—Imports might be about 20–25 percent of consumption, or 3.0–3.7 million pounds, with a foreign value, at

1939 prices, of \$415,000–\$515,000. United States production for the domestic market might be about 11.3–12 million pounds, valued at 25 cents a pound, or about 2.8–3 million dollars.

Duty increased by 50 percent.—Imports might be about 10–12 percent of consumption, or about 1.5–1.8 million pounds, with a foreign value, at 1939 prices, of \$200,000–\$250,000. United States production for the domestic market might be about 13.2–13.5 million pounds, valued at 25 cents a pound, or about 3.3–3.4 million dollars.

Per capita income 75 percent higher than in 1939.

United States consumption might be one-third higher than at the 1939 income level, or about 20 million pounds (about 75 percent higher than the apparent consumption of 1939), depending in part on the assumed rate of duty.

Duty as in 1939.—Imports might be about 15–17 percent of consumption, or about 3.0–3.5 million pounds with a foreign value, at unit values about 25 percent higher than in 1939, of about \$520,000–\$600,000. United States production for the domestic market might be 16.5–17.0 million pounds, valued at 31 cents a pound, or about 5.1–5.2 million dollars.

Duty reduced by 50 percent.—Imports might be about 20–22 percent of consumption or about 4–4.5 million pounds, with a foreign value, at unit values about 25 percent higher than in 1939, of \$700,000–\$780,000. United States production for the domestic market might be about 15.5–16 million pounds, valued, at 31 cents a pound, at about 4.8–5 million dollars.

Duty increased by 50 percent.—Imports might be about 10–13 percent of consumption or about 2–2.6 million pounds, with a foreign value, at unit values about 25 percent higher than in 1939, of \$350,000–\$450,000. United States production for the domestic market might be about 17.4–18 million pounds, valued at 31 cents a pound, or about 5.4–5.6 million dollars.

Exports

At the 1939 income level, exports might be about 50 percent higher than in 1939, or approximately 3.5 million pounds, with a value, at the unit value as of 1939, of about 1.1 million dollars. With the per capita national income 75 percent higher than in 1939, exports might be about 30 percent higher or 4.5 million pounds annually. Assuming an average value of 40 cents a pound, the total value would be about 1.8 million dollars.

Employment

No data are available regarding the number of persons employed in this industry.

CANARY SEED

Tariff paragraph: 764.

Commodity: Canary seed.

Rate of duty: $\frac{1}{4}$ ¢ per lb.

Equivalent ad valorem (1939): 43%.

NOTE.—The rate of 1 cent per pound prescribed by the Tariff Act of 1930 was reduced to $\frac{1}{4}$ -cent per pound by trade agreement with Turkey, effective May 5, 1939; it was further reduced to $\frac{1}{8}$ cent per pound by trade agreement with Argentina, effective November 15, 1941.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For domestic market ¹			
Quantity (1,000 pounds).....	2,000	2,000	15,884	17,884	Percent 89
Value (\$1,000).....			293		
Unit value (cents per pound).....			1.9		

¹ There were no exports.

² Estimated.

³ Foreign value.

Canary seed is used either unmixed or in combination with other seeds for feeding small birds. Though the seed can be produced in the United States, the low unit value of foreign supplies has usually made general production in this country unprofitable. As a result domestic production has been small, and no official statistics relating to it are available. The principal sources of imports are Argentina, Turkey, and Morocco.

Estimated apparent consumption in 1939 was nearly 18 million pounds, a quantity fairly representative of the pre-war annual consumption. Domestic production in that year was probably at the highest level it has been in any year. (Production in 1943 is estimated to have been about 1 million pounds.) The imports in 1939 are representative, but the unit value of 1.9 cents a pound was very low compared with the 1935-38 average 3.3 cents. The ad valorem equivalent of 43 percent in 1939 was relatively higher than in previous years because of the very low foreign unit value of that year. It should be noted that the rate of duty was changed in the trade agreement with Turkey during that year.

During the war imports of canary seed have been relatively small. Although other seeds are substituted to some extent, the potential demand for canary seed at relatively low prices will continue. However, demand at prices sufficiently high to stimulate domestic production does not seem probable.

POST-WAR SHORT TERM

The consumption of canary seed is likely to be as great as in 1939, with probably 90 percent or more of the seed imported. Supplies will probably be available from the same sources as in 1939 at foreign unit values perhaps a little higher than the pre-war average, or about twice as high as in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The consumption of canary seed in this period may be slightly higher than in 1939, possibly in the neighborhood of 20 million pounds. Imported seed will probably supply at least 90 percent of the total

used. The quantity imported may thus total 18 million pounds, or about 12 percent more than in 1939. The foreign unit value may approximate the 1935-38 average price, 3.3 cents a pound. This would indicate a total foreign value of \$595,000, more than twice the 1939 total. Domestic production will probably not exceed 2 million pounds and may be considerably less. Its unit value may be slightly higher than the foreign unit value.

A 50 percent decrease or increase in the rates of duty would probably have no marked effect on the quantity imported.

Per capita income 75 percent higher than in 1939.

Though the consumption of canary seed would probably not be greatly affected by such an increase in consumer income, it might be about 10 percent more than that indicated in the preceding section, or about 22 million pounds. Imports would probably account for at least 20 million pounds, or more than 90 percent of the total. Unit values might be higher, with the foreign price per pound in the neighborhood of 4 cents. On this basis the total foreign value of imports might be in the neighborhood of \$800,000, nearly 3 times the 1939 total. Domestic production might be in the neighborhood of 2 million pounds.

A 50 percent decrease or increase in the rate of duty would probably have no marked effect on the quantity imported.

Exports

Exports, if any, are not separately reported.

Employment

No information regarding labor requirements is available.

FLOWER SEEDS

Tariff paragraph: 764.

Commodity: Flower seeds.

Rate of duty: 3¢ per lb.

Equivalent ad valorem (1939): 2.9%

NOTE.—The rate fixed in the Tariff Act of 1930 was 6 cents per pound, which was reduced to 3 cents effective February 1, 1936, pursuant to trade agreement with the Netherlands.

GENERAL

Data on United States exports and imports for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	(1)	243	(1)	156	(1)	Percent (1)
Value (\$1,000).....	(1)	199	(1)	170		
Unit value (per pound).....		\$0.82		\$1.09		

¹ Not available.

² Foreign value.

The flower-seed industry of the United States is large, but statistics of production and consumption are not available. Most of the domestic output is produced by a few—less than a half dozen—large

firms. Besides these large firms, which ordinarily produce a general line of flower seeds, there are numerous individual growers of one or a few specialties, some of whom market their product all over the United States, and some of whom produce for the local trade only. Most of the large growers produce their seeds in California; the small specialists are scattered throughout the United States. Most flower seeds are grown by the marketing firms themselves.

Although large seed firms catalog from 1,000 to 2,500 different varieties or items of flower seeds, most of them are produced and sold in comparatively small quantities. The seeds of some 20 or 25 kinds are produced and distributed in the United States in large quantities, many of them, such as sweet peas, nasturtiums, zinnias, asters and marigolds in carload lots.

Prior to World War I most of the flower seed used in the United States was imported, principally from Europe. During that war production in California expanded enormously and after the close of the war continued to increase in size and importance, although imports again entered in substantial volume. The imports in 1939 were substantially higher in quantity, though considerably less in value, than those of the preceding 4 years; during 1935-38 they averaged 114,000 pounds annually, with a value of \$193,000.

POST-WAR SHORT TERM

Imports probably will be much less than in 1939, since the European countries which formerly were the principal sources of United States imports probably will not have had sufficient time to again become factors in international trade.

POST-WAR LONG TERM

Consumption, Production, and Imports

There is probably a long-time upward trend in flower seed consumption in the United States. This consumption will probably be supplied chiefly by domestic production. During the present war the United States has become largely independent of European flower seeds. It seems probable that in the post-war long term United States imports will be less than those of 1939, and that they will consist principally of novelties and high-grade specialties of high unit value. The small imports 1941-44 had average unit values of \$5 to \$13 a pound.

An increase or decrease of 50 percent in the duty of 3 cents per pound would have no appreciable effect upon the volume or value of imports, with an ad valorem equivalent of only 2.9 percent in 1939.

Per capita income at 1939 level.

Imports might not be more than 75,000 pounds annually. The unit value might be about \$4 per pound, making the total foreign value of the imports \$300,000.

Per capita income 75 percent higher than in 1939.

Imports might be twice as much as those at the income level of 1939, or about the same as in 1939, about 150,000 pounds. The average foreign unit value probably would be at least \$6 per pound, making the total foreign value of the imports about \$900,000.

Exports

The present war has given a serious set-back to the flower seed industry in European countries, and United States exports of flower seeds in the long-term period may be substantially higher than in 1939.

Employment

No statistics of employment in this industry are available.

LIMA BEANS (WINTER CROP)

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
765-----	Lima beans, green or unripe:		
	General-----	3½¢ per lb-----	93%
	Cuba:		
	December-May-----	1.4¢ per lb-----	54%
	June-November-----	2.8¢ per lb-----	104%

NOTE.—The rate fixed in the Tariff Act of 1930 was 3½ cents per pound (2½ cents if Cuban). The rate on Cuban limas was reduced to 1½ cents when imported from December to May, inclusive, pursuant to the trade agreements with Cuba, effective since September 3, 1934. The general rate was reduced to 2½ cents per pound when imported during the same period, pursuant to the trade agreement with Mexico, effective January 30, 1943.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Apparent consumption	Ratio of imports to consumption
	Total ¹	For domestic market	Imports ¹		
Quantity (1,000 pounds)-----	5,336	5,336	3,969	9,304	Percent 42.6
Value (\$1,000)-----	² 336	² 336	⁴ 103		
Unit value (cents per pound)-----	6.3	6.3	2.6		

¹ Winter crop of Florida only. (Total crop for marketing fresh was 52 million pounds valued at \$2,110,000.) Imports entered during winter months.

² Farm price.

³ Exports were negligible.

⁴ Foreign value.

Lima beans are grown commercially for use in the fresh, or natural state, as dried beans, and for canning and freezing. In 1939, about 64,000 acres were planted with lima beans for all purposes but only about 22 percent produced limas for fresh consumption. The average total domestic all-year-round production of lima beans for the fresh market was 29 million pounds in 1931-35, but increased 41 percent, to an average of 41 million pounds during the 5 subsequent years 1936-40. The following discussion deals exclusively with only a small portion of this production, usually less than 10 percent, which is marketed during the import season of November through March.

Consumption of fresh limas during the import season (November-March), almost wholly restricted to the Florida winter crop and the imported beans, rose from an average of 6.4 million pounds annually during 1934-37 to 8.4 million pounds during 1938-41, and ranged from 11.8 million pounds in 1938 to 5.4 million pounds in 1940.

Domestic production during these two periods rose 128 percent whereas imports declined 6 percent. Since 1940 the growing competition of quick-frozen lima beans, which can be consumed throughout the year, has probably adversely affected the consumption of the fresh product during the import season.

The domestic crop of fresh limas marketed during the import season fluctuates greatly because of variations in acreage planted and weather conditions. Acreage planted is in turn affected considerably by prospective prices in the United States. Statistics of production of the Florida winter crop are not available prior to 1934. Production since then has increased from 1.8 million pounds annually, 1934-37, to 4.1 million pounds, 1938-41, and after 1941 production has remained stationary at about 3.4 million pounds although imports have virtually ceased.

Imports of lima beans, practically all from Cuba, which had been increasing prior to 1930, continued to rise after the increase in rate of duty in the Tariff Act of 1930 (600 percent) because of the continued increase in demand in the United States. After a 50-percent decrease in the rate of duty on Cuba beans in 1934 imports rose only moderately owing to increased domestic supplies. Since 1942 imports have virtually ceased owing to the scarcity of shipping. Because of the expansion of the frozen-food industry in this country imports may not reach their former levels, at least for some time.

POST-WAR SHORT TERM

Consumption of fresh lima beans is not likely to increase during this period much beyond the record figure of 1938. It is probable that the trend toward consumption of frozen lima beans will be accelerated during this period and that imports of fresh limas will be substantially reduced. The rate of decline will probably be slow because of high prices within the United States but imports may be about 15 percent less than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Because of the high quality, convenience, and lower price of quick-frozen limas, it is expected that the demand for fresh limas during the winter months will be sharply reduced. An increase of 50 percent in the duty might accelerate this trend somewhat and a decrease of 50 percent in the duty may retard it to some extent.

Per capita income at 1939 level.

Consumption of fresh limas during winter may be expected to fall below the 1939 volume and may average not more than about 6 million pounds despite the growth in population. If prices received by domestic growers average 6 cents per pound, domestic production may be approximately 4 million pounds, valued at about 240,000 dollars. Imports may then be approximately 2 million pounds, with a foreign value of about \$50,000.

Per capita income 75 percent higher than in 1939.

Under these conditions, production and distribution of quick-frozen lima beans will probably be much greater than under the 1939 income level, and consumption of fresh lima beans during winter may decline

materially. Although an increase or decrease in duty may have some effect on imports, it would be of minor importance compared with the expected effect of competition from frozen beans on both imports and domestic production. Consumption may be about 4 million pounds. Imports may average 1 million pounds with a foreign value of 30,000 dollars. Domestic production under these conditions may average 3 million pounds, valued at about \$300,000.

Exports

Statistics of exports of fresh lima beans are not available, but exports are probably negligible.

Employment

The Florida winter crop of lima beans for fresh use is generally grown in market gardens together with other truck crops. Average labor requirements to produce an acre of lima beans is estimated to be 110 man-hours; the 1939 crop of 2,800 acres represented an equivalent of 38,500 eight-hour man-days. About 20 percent less man-hours would be required if production declines to 4 million pounds and about 40 percent less if it declines to 3 million. There would, of course, be an increase in employment in the production of lima beans in other sections of the country for freezing.

BEANS, LENTILS, CHICKPEAS, DRY-RIPE

Tariff paragraph	Commodity	Rate of duty	Equiva- lent ad valorem (1939)
765	Beans, dry-ripe	3¢ per lb.	88%
767	Lentils	½¢ per lb.	13%
769	Chickpeas or garbanzos	1½¢ per lb.	45%
	Average		46%

NOTE.—The rate on chickpeas or garbanzos, dried, was reduced from 1½¢ to 1 cent per pound, pursuant to the trade agreement with Mexico, effective January 30, 1943.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Im- ports	Apparent consump- tion	Ratio of imports to con- sumption
	Total	For export	For domestic market			
Quantity (1,000 pounds)	1,427,100	49,782	1,377,318	20,366	1,397,684	Percent 1.5
Value (\$1,000)	46,339	1,988	44,351	1,765		
Unit value (cents per pound)	3.2	4.0	3.2	3.8		
Persons employed	(¹)					

¹ Foreign value.

² See under employment.

Dry beans, lentils, and chickpeas or garbanzos are legume seeds which are harvested and marketed in the dry-ripe stage for consumption as human food.

Apparent domestic consumption in 1939 amounted to 1,398 million pounds which was only slightly below the 5-year pre-war average of 1,416 million pounds. Less than 2 percent of consumption of these seeds consisted of lentils and chickpeas and more than 98 percent of dry beans. The trend of per capita consumption (disappearance) of dry beans, which has been upward for more than 30 years, has been affected by the level of consumer income, increasing from 9.5 pounds in the early 1930's to 10.9 pounds in the pre-war period 1936-40.

United States production of these seeds, consisting almost entirely of beans, was 1,427 million pounds in 1939 and averaged 1,408 million pounds annually in the pre-war years 1935-39. Although production in 1939 was larger than the average, increased exports and reduced imports caused consumption to be somewhat less.

Imports of 20 million pounds in 1939 were not typical of the 5-year average of 37 million pounds, largely owing to the smaller imports of beans, which had been declining and were only half as large as usual. During 1936-40, beans constituted, in terms of value, 48 percent of total imports and lentils and chickpeas, 26 percent each, but in 1939 beans constituted only 28 percent of the total. The following tabulation shows the quantity and value of these imports in 1939 and during 1936-40:

Period	Beans	Lentils	Chickpeas	Total
Quantity (1,000 pounds)				
1939	6,132	5,902	8,332	20,366
1936 to 1940, average	19,100	8,690	9,279	37,069
Value (\$1,000)				
1939	209	223	323	755
1936-40, average	651	359	363	1,373

Prices in 1939 (foreign value) were virtually the same as for the 5-year period, namely, beans 3.4 cents per pound; lentils, 4.1 cents; and chickpeas, 3.9 cents. In 1931-35, the foreign price of beans averaged 2.7 cents per pound; lentils, 3.5 cents; and chickpeas, 3.9 cents. Beans have been imported principally from China, with Japan second in importance; lentils, mainly from Chile; and chickpeas from Mexico.

Exports of 50 million pounds of beans in 1939 were nearly twice the average of 29 million pounds during 1936-40.

POST-WAR SHORT TERM

Immediately after the War, United States production of dry beans, which during the war increased by some 40 percent to nearly 2 billion pounds, will probably continue for some time to be considerably higher than in the pre-war period. This will probably result in imports remaining at a low level as during the war. China and Japan, formerly the principal sources of imports, will probably not export beans to the United States for some time, but some may continue to come in from Mexico. As there has been virtually no domestic production of lentils and chickpeas, these seeds will probably continue to be imported in pre-war quantities.

POST-WAR LONG TERM

Consumption, Production, and Imports

As the trend in per capita consumption had been upward before the war, it will probably be higher than in 1939, but probably not so high as the pre-war trend might indicate. Domestic production (of beans) will probably be large enough to take care of increasing per capita consumption, as well as the increase in population, or any possible increase in exports. Imports of beans for civilian consumption, which had been declining before the war, will probably be still further reduced, but imports of lentils and chickpeas will probably increase somewhat with the population, unless there is a marked increase in domestic production. Changes in the duty by 50 percent in either direction would probably affect imports of beans, as the present rate of duty is high and the domestic supply would be ample, but probably would not materially affect imports of lentils or chickpeas as the demand for them is relatively constant, the domestic supplies not sufficient, and the duties considerably lower than on beans.

Per capita income at 1939 level.

Assuming that per capita consumption would rise to 11.5 pounds, with exports about equal to imports and allowing for a 10-percent increase in population, total consumption might be about 1,656 million pounds.

Duty as in 1939.—Domestic production might supply about 98 percent of consumption, and imports 2 percent. Production for the domestic market of 1,626 million pounds at 3.2 cents per pound would have a value of 52 million dollars. Imports, possibly consisting of equal parts of beans, lentils, and chickpeas, might total about 30 million pounds, which, if the average price were 3.8 cents per pound, would have a foreign value of about 1.1 million dollars.

Duty reduced by 50 percent.—Although imports of lentils and chickpeas would probably be little affected, imports of beans might increase 100 percent over those with duty as in 1939, or to 40 million pounds, with a foreign value of 1.5 million dollars. This quantity would be about 2.5 percent of consumption. Production for the domestic market might then total 1,616 million pounds, with a value of 51.7 million dollars.

Duty increased by 50 percent.—Imports of beans might cease altogether, but those of lentils and chickpeas remain little, if at all, affected. Imports might then amount to only a little more than 1 percent of consumption, or to about 20 million pounds, consisting almost entirely of lentils and chickpeas; their foreign value might be approximately \$750,000. Production for the domestic market might total 1,636 million pounds, valued at about 52.4 million dollars.

Per capita income 75 percent higher than in 1939.

Per capita consumption might increase to 12 pounds and total consumption to 1,728 million pounds.

Duty as in 1939.—Imports might supply about 2 percent of consumption, or about 40 million pounds, with a total foreign value of 1.8 million dollars.

Domestic production would then supply about 1,688 million pounds, with a total value, at 4 cents per pound, of 67.5 million dollars.

Duty reduced by 50 percent.—As under the lower income, imports of beans might increase 100 percent over those under the duty as in 1939, and those of lentils and chickpeas be little, if at all, affected. Total imports might then be about 50 million pounds, nearly 3 percent of consumption, and might have a foreign value of 2.2 million dollars. Production for the domestic market might then total 1,678 million pounds, and would have a value of 67.1 million dollars.

Duty increased by 50 percent.—Imports of beans might be largely eliminated, and total imports, consisting largely of lentils and chickpeas, might total possibly 30 million pounds, or less than 2 percent of consumption, with a foreign value of about 1.4 million dollars. Production would then supply about 1,698 million pounds, which would have a value of 67.9 million dollars.

Exports

Although exports amounted to about 50 million pounds in 1939, in the 5-year pre-war period they averaged about 30 million pounds, with a value of nearly 1.2 million dollars. They might be as large as this again after the war, but at the higher income level possibly amount to 60 million pounds, with a value of 3 million dollars.

Employment

Before the war about 1.9 million acres of beans were produced annually, which at 25 man-hours per acre required 47 million man-hours, nearly 6 million man-days, or 20,000 persons employed the year round. After the war this might increase by at least 10 percent, or to 22,000 persons employed full-time, the year round.

DRIED AND CANNED MUSHROOMS

<i>Tariff paragraph</i>	<i>Commodity</i>	<i>Rate of duty</i>	<i>Equivalent ad valorem (1939)</i>
768.....	Mushrooms:		
	Dried.....	10¢ per lb. + 45% ad val.	64%.
	Canned.....	8¢ per lb. + 25% ad val.	63%.
	Average.....		64%.

NOTE.—The duty on canned mushrooms was reduced from 10 cents per pound plus 45 percent ad valorem to the rate indicated above, effective June 15, 1936, pursuant to trade agreement with France.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Imports	Production ¹		Imports	Appar-ent con-sump-tion	Ratio of imports to con-sump-tion
	Total ²	For do-mestic market			
Quantity (1,000 pounds):					<i>Percent</i>
Dried mushrooms.....	100	100	501	601	85
Canned mushrooms ³	17,640	17,640	800	18,530	5
Total.....	17,740	17,740	1,481	19,221	5
Value (\$1,000):					
Dried mushrooms.....	100	100	\$ 305		
Canned mushrooms.....	2,897	2,897	\$ 185		
Total.....	\$ 2,997	\$ 2,997	\$ 490		
Unit value (cents per pound):					
Dried mushrooms.....	100.0	100.0	51.5		
Canned mushrooms.....	16.4	16.4	20.8		
Average.....			33.1		

¹ Estimated.

² Exports were negligible.

³ Drained weight; approximately one-half of total net weight.

⁴ Foreign value.

Canned mushrooms are used primarily in the preparation of sauces in hotels, restaurants, and households. Dried mushrooms are consumed as a relish and as an ingredient in the manufacture of canned soup. Adequate statistics on domestic production and consumption are not available; the 1939 data given represent estimates by the trade. Consumption of fresh mushrooms during the period 1929-39 expanded materially. However, adequate statistics of consumption and production with respect to fresh mushrooms are not available. United States consumption of canned mushrooms is largely limited by the increased volume of production and sale of fresh mushrooms. For most uses the fresh product is preferred now that it is available at moderate cost during most of the year and in most markets. Therefore, with an increase of national income, the consumption of canned and dried mushrooms will probably expand only moderately and fresh mushrooms will benefit more from the larger demand.

United States production of canned mushrooms, which dates from 1918, is to a considerable extent an industry which is subordinate to the marketing of fresh mushrooms, the raw material of the canners being largely mushrooms withheld from the fresh market. Production of dried mushrooms in the United States is quite limited.

Imports of canned mushrooms ranged from 3 million to 8 million pounds annually during the 1920's. Following an increase in the rate of duty in 1930, imports dropped, averaging 1.5 million pounds annually, 1931-35, and notwithstanding a decrease in the rate of duty in 1936, continued to decline to an average of 810,000 pounds annually, 1936-40, probably as a result of increased production in the United States. The major sources of imports of canned mushrooms were France and Japan, which furnished about 85 and 15 percent, respec-

tively. The French product was used principally by hotels and restaurants.

Dried mushrooms were imported principally from Poland, Japan, and France. Imports during the 1930's averaged 534,000 pounds annually, a decrease of 40 percent from the previous decade. Despite the growth in population, imports of dried mushrooms remained fairly constant in the 1930's. Beginning in 1941 imports were curtailed sharply because of the war.

POST-WAR SHORT TERM

During the war the demand for canned and dried mushrooms has been supplied by the domestic product. It is likely that imports immediately after the war will be small compared with those of 1939. United States production is likely to be somewhat greater than in 1939 but may continue to be limited by the sale of fresh mushrooms.

POST-WAR LONG TERM

Consumption, Production, and Imports

Only a moderate increase in consumption of canned and dried mushrooms is probable as a result of population increase or of higher national income; increased consumption will be largely supplied by fresh mushrooms. Imports will probably regain about that proportion of the trade which they held in 1939 because the imported product enjoys a special market and for this reason a decrease or increase by 50 percent in the rate of duty may result in only moderate increases or decreases in the quantity of imports.

Per capita income at 1939 level.

Consumption of canned and dried mushrooms is likely to be about 20 million pounds (canned mushrooms at drained weight), an increase of about 4 percent above the 1939 level.

Duty as in 1939.—Imports might be about 8 percent of consumption, or about 1.6 million pounds. At 1939 prices, these imports would have a foreign value of about \$530,000. United States production for the domestic market might be about 18.4 million pounds, valued at 17 cents a pound, or approximately 3 million dollars.

Duty reduced by 50 percent.—Imports might be about 10 percent of consumption or about 2 million pounds. At 1939 prices these imports would have a foreign value of about \$660,000. United States production for the domestic market might be about 18 million pounds, valued at 17 cents a pound, or approximately 3.1 million dollars.

Duty increased by 50 percent.—Imports might be about 5 percent of consumption or about 1 million pounds. At 1939 prices, these imports would have a foreign value of about \$330,000. United States production for the domestic market might be about 19 million pounds, valued at 17 cents a pound, or about 3.2 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of canned and dried mushrooms might be about 24 million pounds (canned mushrooms at drained weight), an increase of about 25 percent above the 1939 level.

Duty as in 1939.—Imports might be about 8 percent of consumption or about 1.9 million pounds. At an average value of 38 cents per

pound, these imports would have a foreign value of \$722,000. United States production for the domestic market might be about 22.1 million pounds, valued at 20 cents per pound, or about 4.4 million dollars.

Duty reduced by 50 percent.—Imports might be about 10 percent of consumption or about 2.4 million pounds. These imports, at 38 cents per pound, would have a foreign value of \$912,000. United States production for the domestic market might be about 21.6 million pounds, valued at 20 cents a pound, or about 4.3 million dollars.

Duty increased by 50 percent.—Imports might be approximately 5 percent of consumption or about 1.2 million pounds. These imports, at 38 cents a pound, would have a foreign value of about \$456,000. United States production for the domestic market might be about 22.8 million pounds, valued at 20 cents a pound, or about 4.6 million dollars.

Exports

Exports of canned and dried mushrooms have been negligible and there is no likelihood of consequential exports of these products in the post-war period.

Employment

It is not possible to estimate employment for these products, as adequate statistics are not available.

PEAS, CANNED

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
769	Peas, canned (except black-eye cowpeas and chickpeas):		
	Valued at 10¢ or more per lb.	1½¢ per lb.	13%
	Other	2¢ per lb.	37%

NOTE.—The rate fixed in the Tariff Act of 1930 was 2 cents per pound on the entire contents of the container. The rate was reduced to 1½ cents on canned peas valued at 10 cents or more per pound, effective May 1, 1936, pursuant to trade agreement with Belgium.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds)	482,230	5,302	476,918	1,159	478,077	Percent 0.2
Value (\$1,000)	34,356	368	33,988	122		
Unit value (per pound)	\$0.07	\$0.069	\$0.071	\$0.105		
Persons employed	(?)					

¹ Valued at 10 cents or more per pound, 1,000,796 pounds, valued at \$113,678; valued at less than 10 cents per pound, 188,432 pounds, valued at \$2,630.

² Foreign value.

³ See discussion under "Employment."

The figures for 1939 are not representative of immediate pre-war years. A more accurate measure of peacetime conditions may be obtained by using the 5-year average, 1936-40:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	640,546	4,365	636,181	1,503	636,684	Percent 0.08
Value (\$1,000).....	44,198	325	43,873	51		
Unit value (per pound).....	\$0.069	\$0.074	\$0.069	\$0.101		
Persons employed.....	(3)					

¹ Valued at 10 cents or more per pound; 322,936 pounds valued at \$40,297; valued at less than 10 cents per pound, 179,794 pounds valued at \$10,373.

² Foreign value.

³ See under employment.

Peas rank among the four most important canned vegetables in the United States. Consumption averaged 637 million pounds annually, 1936-40, an increase of 38 percent over the preceding 5-year period, 1931-35. Per capita consumption averaged 4.1 pounds during the 1920's, declined to 3.7 pounds in the depression years, 1931-35, and rose to 4.9 pounds in the following 5 years, 1936-40. A reversal of this upward trend is probable, owing to increasing competition from the quick-frozen peas.

Production of canned peas has followed an upward trend since 1930, ranging from 311 million pounds in 1932 to 764 million pounds in 1938. During the 5-year period, 1936-40, production averaged 641 million pounds annually (58 percent above 1939), an increase of 39 percent over the prior period, 1931-35. In response to wartime demands, production since 1941 has averaged over 1 billion pounds annually.

Imports of canned peas represent much less than 1 percent of consumption. Roughly two-thirds of the imported peas are a fancy product, extremely small, and sold at relatively high prices by distributors of high-priced foods. The cheaper grade of imported pea is also a specialty item for which only a limited demand exists. Imports have been declining steadily since 1930, notwithstanding a decrease in the rate of duty in 1935 on those peas valued at 10 cents or more per pound (see note above). The chief sources of the high-grade peas are Belgium and France; the cheaper grade was shipped from Syria, and Japan. In some years Canada has been the principal source of imports. However, they are similar to the domestic pack and most imports from Canada actually represent inter-company transfers from subsidiary branches of United States canning plants.

POST-WAR SHORT TERM

Consumption and domestic production of canned peas are hardly likely to increase during this period much beyond the pre-war period, 1936-40, owing to the expected expansion of the quick-frozen pea industry. Imports may resume their pre-war downward trend. There is little likelihood of receiving peas from Japan, and Belgium

and France may require theirs for home use. Exports may increase considerably over the pre-war average of 4.3 million pounds annually, 1936-40, owing to the probability that a large number of Americans may be abroad during this period.

POST-WAR LONG TERM

Consumption, Production, and Imports

The demand for canned peas may be reduced during this period particularly if the frozen-food industry maintains its expected rate of expansion. Consequently, despite the growth in population, consumption of canned peas may be considerably below the pre-war average, 1936-40. It is doubtful whether imports will regain their pre-war levels, particularly if income is at the 1939 level, and they may thus represent an even more negligible proportion of consumption. In view of the specialized and limited demand for the commodity, an increase or decrease of 50 percent in the duty would probably have little effect on imports, especially the higher-priced grades.

Per capita consumption of canned peas in the post-war long-term might, in the face of competition from frozen peas, be somewhat below that which prevailed during the depression years 1931-35 under both assumed levels of national income. Total consumption might thus average about 500 million pounds, or 21 percent below the pre-war average, 1936-40. Regardless of the assumed decrease or increase of 50 percent in duty, imports will probably remain insignificant, and supply about one-tenth of 1 percent of consumption, or say 500,000 pounds with a foreign value of about 52,000 dollars. Production, as in the past, would thus probably continue to supply practically the entire domestic requirements as well as exports, and amount to about 500 million pounds, valued at about 36 million dollars under the 1939 level of income, and 50 million dollars, under the assumed 75 percent higher level of income.

Exports

Exports of canned peas average 2.4 million pounds during the 5-year period 1931-35 and rose 80 percent to 4.3 million pounds in the ensuing 5 years. The chief destinations for exports are the Philippines, the United Kingdom, Cuba, Panama, and the Canal Zone. If large numbers of Americans remain abroad in the long term, exports of canned green peas may increase substantially, doubling or even trebling the pre-war average. However, even under the most favorable circumstance, exports will probably not amount to much more than 3 percent of production.

Employment

Average labor requirements to produce an acre of green peas for processing is estimated to be 24 man-hours; the pre-war average of 307,380 acres represented an equivalent of 3,074 man-years. To produce the estimated crop of 500 million pounds in the long-term period discussed above, about 2,428 man-years would be required. The number of persons employed in canning is estimated to have been about 12,000 in the pre-war period and close to 10,000 in the post-war period. The decline in labor required to grow peas for canning in the post-war period would be more than offset by increased requirements to produce the product for freezing.

GREEN PEAS (WINTER CROP)

Tariff paragraph: 769.

Commodity: Peas, green or unripe
(except cowpeas and chickpeas)—winter crop.

Rate of duty: 3.9¢ per lb.

Equivalent ad valorem (1939): 80%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 3 cents per pound, which was increased to 3½ cents effective January 1, 1932, by Presidential proclamation under section 336 of the tariff act. The equivalent ad valorem of 80 percent was arrived at without including duties on 13,350 pounds valued at \$156, imported into Virgin Islands. Pursuant to the trade agreements with Canada, effective January 1, 1938, and January 1, 1939, the duty was reduced in 2 cents per pound on imports from July to September, inclusive, in any year. Pursuant to the trade agreement with Mexico, effective January 30, 1943, the 2 cents per pound was made effective throughout the year.

GENERAL

Data on United States production, imports, and consumption for 1939 (December–March) are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	42,570	(¹)	42,570	1,959	44,529	Percent 4.4
Value (\$1,000).....	2,420	(²)	2,420	95		
Unit value (cents per pound).....	5.7		5.7	4.8		
Persons employed.....	(³)					

¹ Production shown is marketed during import season (December–March). All-year-round production for marketing fresh amounted to 277 million pounds in 1939.

² Negligible.

³ Imports during December–March only. Total imports in the year were 2,054,064 pounds. Green peas are also imported during the summer months, July through September. These imports are usually from Canada and are of minor importance, accounting for less than 3 percent of annual imports.

⁴ Farm value.

⁵ Exports amounted to 2.3 million pounds. However, only a negligible portion was exported during the import season.

⁶ Foreign value.

⁷ See under employment.

The garden or green pea is grown almost exclusively for human consumption. About three-quarters of the green peas are canned or frozen and the remainder sold fresh for immediate consumption. The average domestic all-year-round production of green peas for the fresh market rose 10 percent, or from 237 million pounds during the 5-year period 1931–35 to 260 million pounds in the ensuing 5 years, 1936–40. The following discussion deals exclusively with only a small portion of this production, ranging from 11 to 16 percent, 1931–40, which is marketed during the import season, December through March.

Consumption of green peas during the import season (December–March) averaged 38 million pounds annually, 1931–35, and rose 21 percent to 46 million pounds in the subsequent 5 years, 1936–40. Owing to increased domestic production and the decline in imports the ratio of imports to consumption dropped from 30 percent in 1931–35 to 7 percent in 1936–40. During 1941–44, imports supplied 20 percent of consumption.

Virtually all imports of fresh green peas come from Mexico and occur almost entirely in the 4-month period December through March. Imports during this 4-month period averaged 11 million pounds

annually during 1931-35, declined to 3 million pounds during 1936-40, and averaged 8 million pounds annually during 1941-44.

United States production of green peas for marketing during the import season is virtually confined to Florida, Texas, and the Imperial Valley of California. Production during the import season fluctuates considerably because of periodic partial crop failures and variations in acreage planted. Production has expanded substantially, increasing from 27 million pounds annually, 1931-35, to 43 million pounds in the following 5 years, 1936-40, largely as a consequence of increased acreage in Texas and Florida. Production since 1940 declined to 30 million pounds annually largely as a result of poor crops.

POST-WAR SHORT TERM

A reversal of the upward trend in consumption which occurred during the 1930's is expected to set in shortly after the end of the war. Wider distribution of frozen peas during this period may restrict the demand for the fresh product. The rate of decline in domestic production may be retarded somewhat by high prices. Imports, however, may decline to their pre-war levels and continue the downward trend.

POST-WAR LONG TERM

Consumption, Production, and Imports

The following estimates are based on the assumption that the higher quality, convenience, and relatively lower prices of frozen green peas may curtail sharply the demand for fresh green peas during the winter months. Regardless of the assumed level of income, consumption of fresh peas during the winter months may range between one-half and two-thirds of the 1939 consumption and amount to 22-30 million pounds.

Per capita income at 1939 level.

Duty same as in 1939.—Domestic production under these conditions may be 21-28 million pounds, valued at 1.2-1.6 million dollars. Imports may thus be in the neighborhood of 1.1-1.5 million pounds, 5 percent of consumption, with a foreign value of about \$53,000-\$72,000.

Duty reduced by 50 percent.—This reduction in duty may tend to lower prices somewhat. Imports, in response to a reduction in duty, may increase substantially and supply around 20 percent of consumption during the import season, or 4.4-6.0 million pounds, with a foreign value of \$198,000-\$270,000. Domestic production may thus be about 18-24 million pounds, valued at \$968,000-\$1,300,000.

Duty increased by 50 percent.—Domestic production under slightly higher prices may probably fill the entire requirements and be valued at about 1.7 million dollars. Imports would probably be negligible because of the increase in the duty.

Per capita income 75 percent higher than in 1939.

Duty same as in 1939.—Despite higher prices production may be only 21-28 million pounds valued at 1.6-2.1 million dollars, and imports amount to 5 percent of consumption, or 1.1-1.5 million pounds, with a foreign value of about \$66,000-\$90,000.

Duty reduced by 50 percent.—As a consequence of the reduction in duty, prices may be depressed somewhat and domestic production may thus amount to around 80 percent of consumption or about 18–24 million pounds valued at about 1.2–1.6 million dollars. Imports in response to the lower rate of duty may rise and supply 20 percent of consumption or about 4.4–6.0 million pounds with a foreign value of, say, \$252,000–\$348,000.

Duty increased by 50 percent.—Consumption may be entirely supplied by domestic production, valued at 2.6 million dollars. Despite higher prices, imports may be negligible because of the increase in the duty.

Exports

Exports of green peas during the import season are of minor importance and no substantial change in this trade is foreseen in the post-war period.

Employment

Green peas grown for marketing fresh during the import season come predominantly from specialized truck farms. Average labor requirements to produce an acre of green peas for fresh use is estimated to be 125 man-hours; the 1939 crop of 17,400 acres represented an equivalent of 906 man-years. About 25 to 50 percent less man-years would be required if production declines to the levels estimated in the long-term period. There would, of course, be an increase in employment in the production of green peas in other sections of the country for freezing, and the freezing industry would have to expand.

ONIONS

Tariff paragraph: 770.

Commodity: Onions.

Rate of duty: 2½¢ per lb.

Equivalent ad valorem (1939): 146%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1,815,400	51,858	1,763,542	4,866	1,768,406	Percent 0.3
Value (\$1,000).....	15,666	723	14,943	184		
Unit value (per 100 pounds).....	\$0.86	\$1.39	\$0.85	\$1.72		
Persons employed ¹						

¹ Foreign value.

² Number of farms reporting production of onions in 1939—29,100.

During the period 1935–39, production averaged 1.6 billion pounds annually, compared with 1.4 billion pounds during the period 1930–34 and 1.2 billion pounds during the period 1925–29. In 1939, the production of onions was slightly higher than the 1935–39 average

and average domestic prices in that year, 88 cents per 100 pounds, were much lower than the average of \$1.12 per 100 pounds in 1935-39. For the 1944 crop of onions, price ceilings have been authorized that will give to growers a yearly average of \$2.99 per 100 pounds. Per capita consumption amounted to about 12 pounds annually in 1935-39 as compared with about 11 pounds during each of the 2 preceding 5-year periods.

The domestic crop may be divided into three groups according to the time of the harvest—the early group in late April-June, the intermediate in July and August, and the late in September and October. The early and intermediate groups are consumed soon after harvesting. The late group, comprising about 75 percent of the total crop, is consumed from September to the following April. Prices of onions normally fluctuate materially during the season, the lowest usually occurring during the harvesting of the late crop, in September-October, and the highest during the late winter and early spring months.

Imports enter the United States largely during late winter and early spring, when the last of the late domestic crop is being marketed from storage, and before the marketing of the early domestic crop begins; that is, when domestic prices are at their highest. In recent pre-war years imports in February-April have come principally from Chile and Argentina and later in the spring from Italy. Before the increase in duty under the act of 1930, when imports ranged between 75 million and 135 million pounds, with a foreign value of 1.5 million to 2.8 million dollars, Spain and Egypt were the chief sources of imports.

In the 1930's United States exports of onions regularly exceeded imports, and usually by a wide margin. They usually occurred in the marketing seasons in the summer and fall, when domestic prices were lowest.

POST-WAR SHORT TERM

Consumption of onions in the immediate post-war period seems likely to be about 5 percent higher than the average of 1935-39 and about the same as in 1939, with the unit value probably considerably higher than 1939. Imports will probably continue to be relatively small.

POST-WAR LONG TERM

Consumption, Production, and Imports

Because of the export surplus, production of onions is usually 2½ to 5 percent larger than consumption, depending on the level of duty and hence the level of imports.

Per capita income at 1939 level.

It seems probable that the per capita consumption of onions in the post-war long term will be about 12 pounds, the same as during 1935-39, whether the duty remains the same or is increased or decreased by 50 percent. Making allowance for the 10-percent increase in population, this may bring total consumption up to somewhere about 1.85 billion pounds. Domestic price of onions will probably be about \$1.15 per 100 pounds.

Duty as in 1939.—Under the duty of 2½ cents per pound, imports would probably enter during only a few months of the year when

prices are high and would probably not be much larger or smaller than in 1939, totaling, say, 4-6 million pounds, with a foreign value of \$75,000-\$100,000 annually, assuming the same foreign unit value of imports as in 1939. Production for the domestic market would be about 1,845 million pounds, valued at about 21.2 million dollars.

Duty reduced by 50 percent.—A reduction in the duty to \$1.25 per 100 pounds may enable imports to compete with domestic supplies over a longer season than if the 1939 duty rate were effective. It might also result in some revival of imports from Spain and Egypt. Imports might increase as much as fivefold above the 1939 level, or to 20-30 million pounds, with a foreign value of \$350,000-\$500,000. Production for the domestic market would probably be about 1,825 million pounds, valued at about 20.5 million dollars.

Duty increased by 50 percent.—The increase in duty to \$3.75 per 100 pounds would probably be almost prohibitive except when domestic prices are unusually high. It seems probable that only onions of the highest quality would be imported and then only for a short period in the late winter and early spring before the early domestic crop is available. Imports would probably not exceed 2-3 million pounds, valued at \$50,000-\$75,000. Production for the domestic market would be about 1,848 million pounds, valued at about 21.2 million dollars.

Per capita income 75 percent higher than in 1939.

With an increase in per capita income, it seems likely that the per capita consumption of onions will be only slightly higher since there has been little tendency for per capita consumption to increase during periods of high national income. Total consumption might be about 1.95 billion pounds. Domestic prices of onions would probably be about \$1.35 per 100 pounds.

Duty as in 1939.—With the rate of duty the same as in 1939, imports would probably supply about the same percent of total consumption as in 1939, say 6-10 million pounds, with a foreign value of \$125,000-\$150,000, assuming price about 25 percent higher than in 1939. Production for the domestic market would probably be about 1,940 million pounds, valued at about 35.9 million dollars.

Duty reduced by 50 percent.—A 50-percent reduction at this level of national income would probably cause a much larger increase in imports than with income at the level of 1939; in particular, it would be much more likely to cause a revival of imports from Spain and Egypt, especially from Spain, and result not only in imports in the off-season but possibly limited imports of special types of onions in other parts of the year. Imports might rise as high as 75-100 million pounds, with a foreign value of 1.0-1.5 million dollars, assuming an average foreign price about 20 percent lower than in 1939. This price is lower than the foreign value in 1939 because imports would come mainly at a different time of the year when prices are lower. With such imports, production for the domestic market (i. e., total production less exports) would be about 1,850 million pounds, valued at 34 million dollars.

Duty increased by 50 percent.—A duty of \$3.75 per 100 pounds would probably restrict imports to the period of low domestic supplies in late winter and early spring, when prices are unusually high. Under these

conditions, imports may be 4-6 million pounds valued at \$100,000-\$125,000. Production for the domestic market would probably be about 1,945 million pounds, valued at about 36 million dollars.

Exports

United States exports of onions have exceeded imports in every year since 1931. Exports, like imports, are largely seasonal; they are largest during the period of abundant domestic supplies, normally from May through to the following January. Most of the exports have gone to Canada and Mexico. This trade seems likely to continue and with higher levels of world income and reduced trade barriers, annual exports in the post-war period might be about 75 million pounds, valued at about 1.5 million dollars at the 1939 level of income and about 1.8 million dollars at the higher level of income.

Employment

No data are available regarding the number of workers engaged in onion production. Production of onions was reported on 29,100 farms in 1939. Onions require a great deal of hand labor, especially for weeding and harvesting the crop. Much of this work is done by day labor employed for short periods.

GARLIC

Tariff paragraph: 770.

Commodity: Garlic.

Rate of duty: $1\frac{1}{4}$ ¢ per lb.

Equivalent ad valorem (1939): 43%.

NOTE.—The rate shown above is that fixed in the Tariff Act of 1930. It was reduced to $\frac{1}{4}$ cent per pound, effective January 20, 1943, pursuant to the trade agreement with Mexico.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	19,300	1,000	18,300	4,140	22,440	Percent 19
Value (\$1,000).....	616	32	584	143		
Unit value (cents per pound).....	3.19	3.20	3.19	3.46		
Persons employed.....	(?)					

¹ Exports not reported in official statistics but estimated at about 1 million pounds.

² Foreign value.

³ 682 farms reported production of garlic.

Garlic is a seasoning used in minute quantities in many dishes. Its cost is a trivial part of food costs, and changes of levels of national income in the pre-war period had no effect on average per capita consumption.

Consumption of garlic increased from about 19 million pounds annually in 1925-29 to about 22 million pounds in 1935-39. The per capita consumption has remained at 0.16 pound. Imports amounted to about 30 percent of total consumption during the

former period compared with 25 percent in the latter one, and with 20 percent in 1939 though the duty had been reduced in 1930 from 2 cents to 1½ cents per pound.

Since 1925, production has ranged from a low of 12 million pounds in 1932 to a peak of 20 million in 1937; imports from a low of 3 million in 1927 to 6 million in 1932. Production and imports in 1939 may be considered as normal.

About 80 percent of the domestic commercial crop is produced in California, the remainder in Texas and Louisiana. The garlic produced in Texas and Louisiana is marketed from June to August, practically none of it being stored. The California crop is marketed from June to the following March or April, that marketed during the fall and winter months being from storage.

United States imports from the several sources arrive during the following periods: from Chile, mostly from January to July; from Spain, from July to the following April; and from Mexico, mostly from March to July. In certain years when the United States price has been high imports from Chile and Mexico have come in other months of the year. Practically all the imports from Spain enter Puerto Rico; only small quantities enter the continental United States. The bulk of the imports from Chile normally enters at New York, which is the largest market for garlic in the United States. In 1937 and 1938, however, substantial quantities from Chile entered at Puerto Rico.

Most of the garlic produced in the United States is off the market during late winter until the new crop starts in May or June. During this period, the new crop of garlic from Chile and Mexico is available to supply continental United States, and market prices are normally higher than at other seasons of the year. About 20 percent of the consumption is during this season.

The difference between the prices of imported and of domestic garlic on the New York market is due largely to the seasonal factor. At the end of the domestic season, the price on the New York market of the best grade of California garlic from storage is slightly less than the price of the new crop from Chile, but it is higher than the garlic from Mexico.

POST-WAR SHORT TERM

It seems likely that in the short term, the consumption per capita of garlic will remain about the same as in the immediate pre-war period, or about 0.16 pound. Total consumption seems likely to be about 5 percent above the consumption in 1939. In the pre-war period production has supplied a slowly increasing percentage of total consumption. It seems probable that this trend will continue and production will probably amount to about 80 percent of consumption.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Because the consumption per capita has remained at the level of 0.16 pound during several 5-year periods before 1939, total consumption during the post-war period will probably be dependent upon the increase in population. Assuming an increase in population of 10

percent, total consumption seems likely to amount to about 25 million pounds. Because of the seasonal factor in marketing garlic, production for the domestic market seems likely to continue to supply in the neighborhood of 80 percent of total consumption, or about 20 million pounds, valued at about \$630,000 to \$660,000.

Duty as in 1939.—It seems likely that imports will increase at about the same rate as population so as to supply consumption when supplies from domestic production are off the market. Imports might increase about 10 percent above 1939 level to about 4.6 million pounds, or 18 percent of consumption, with a foreign value of about \$160,000.

Duty reduced by 50 percent.—A decrease in duty would probably extend the season in which the imports might compete on a price basis with domestic production. Imports might increase to about 5.2 million pounds, or 21 percent of consumption, with a foreign value of about \$175,000.

Duty increased by 50 percent.—An increase in duty would probably affect the quantity and value of imports very little because of the seasonal character of imports. Possibly imports from Spain into Puerto Rico might decrease slightly because they enter principally during the normal marketing season of the domestic crop. Shipments from the United States to Puerto Rico might increase slightly. Imports might supply about 17 percent of consumption, or about 4.3 million pounds, with a foreign value of about \$150,000.

Per capita income 75 percent higher than in 1939.

On the basis of pre-war consumption per capita consumption seems likely to increase at about the same rate as population, not much influenced by increase in per capita income. Prices of garlic, however, might rise 20 percent. Consumption, therefore, would probably be about 25 million pounds. Production seems likely to continue to supply about 80 percent of consumption, or 20 million pounds, valued at \$730,000 and in addition to this from 1-1½ million pounds for export. Practically all of this would be consumed during July to the following February, and imports would supply the remainder during the season of short domestic supplies.

Duty as in 1939.—The quantity of imports will probably increase at the same rate of population and will probably amount to about 18 percent of consumption, or about 4.6 million pounds, with a foreign value of \$190,000.

Duty reduced by 50 percent.—With the exception of increased value of imports, the situation would probably be about the same as if the per capita income were the same as in 1939. Imports would probably supply about 21 percent of consumption, or about 5.2 million pounds, with a foreign value of about \$210,000. Imports will probably compete with domestic production over a slightly longer season. Imports from Spain into Puerto Rico seem likely to increase at a higher rate than those from Chile and Mexico because they compete over a longer period with shipments from the United States.

Duty increased by 50 percent.—An increase in duty may restrict imports somewhat, though not greatly, because of lack of United States production on the market during the season when consumption depends upon imports for supplies. Imports may supply about 17 percent of consumption, or about 4.4 million pounds, with a foreign value of \$185,000.

Exports

Exports of garlic are made during the season of large domestic supplies. Official export statistics are not available, but estimates made by important members of the trade indicate that in the neighborhood of 1 million pounds, valued at \$32,000, have been exported annually to Cuba, Canada, and various other countries. It seems likely that this trade will continue in the post-war period, and under favorable conditions might increase to 1.5 million pounds, with a value of about \$55,000.

Employment

Statistics are not available showing the number of persons employed in the production of garlic. There is a large amount of hand labor required in weeding and harvesting garlic. The census of 1939 reports 682 farms in the United States produced garlic. The United States Department of Agriculture estimates that 151 man-hours are required to produce an acre. On this basis 270 man-years were required to produce the garlic crop in 1939. In the post-war long term the labor requirements seem likely to be about 300 man-years.

- POTATOES

Tariff paragraph: 771.

Commodity: Potatoes (white or Irish): Certified seed and table stock.

Rate of duty: $37\frac{1}{2}$ cents per 100 pounds ($22\frac{1}{2}$ cents per bushel). *Equivalent ad valorem (1939): 24%.*

NOTE.—The rate fixed in the Tariff Act of 1930 was 75 cents per 100 pounds (whether seed or otherwise). Reduced rates were made effective on certified seed on a tariff quota basis on January 1, 1936, pursuant to the first trade agreement with Canada. Further reductions in duty on a tariff quota basis were made on January 1, 1939, pursuant to the second agreement with Canada, which also reduced rates on table stock on a tariff quota basis. Existing rates are $37\frac{1}{2}$ cents per 100 pounds on certified seed imports throughout the year and on table stock imports from March to November, inclusive, and 60 cents per 100 pounds on table stock imports from December to February, inclusive. Entries in excess of tariff quotas are subject to duty of 75 cents per 100 pounds. Imports from Cuba are dutiable at 30 cents per 100 pounds throughout the year, and are not included in tariff quotas.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 bushels).....	342,420	2,667	339,753	1,564	341,297	Percent 0.4
Value (\$1,000).....	226,517	2,252	226,265	1,527		
Unit value (per bushel).....	\$0.70	\$0.84	\$0.70	\$0.98		
Persons employed (number).....	250,000					

¹ Composed of 263,000 bushels of table stock and 1,201,000 bushels of certified seed potatoes.

² Foreign value.

³ Estimated.

Per capita consumption of potatoes in the United States has been decreasing steadily since 1921, largely because of the change in American diet from starchy foods (potatoes and cereals) to beans, leafy

vegetables, and fruits. It seems probable that this downward trend will continue independently of fluctuations in national income; if anything, it may be more pronounced at a high level of national income, as at such a level there may be increased substitution of higher priced vegetables and fruits for potatoes.

In the years 1937 to 1941 the production of potatoes averaged about 361 million bushels annually (somewhat more than in 1939), of which 80 percent was consumed as human food, 10 percent used for seed, and the remaining 10 percent lost, fed to livestock, and utilized for industrial purposes. A relatively recent development in the potato industry is the production of certified stock grown expressly for seed. The trend of the pre-war crop of certified seed was steadily upward, and in 1937-41 averaged 12 million bushels annually.

Potatoes are produced primarily for consumption within the United States. In recent years exports, consisting almost wholly of table stock, have not exceeded 3 million bushels annually, and imports, chiefly seed potatoes, have amounted to less than 2 million bushels. Late potatoes have been exported to nearby tropical countries and early potatoes to Canada; but the import trade has been almost entirely with Canada.

Successive reductions in the rate of duty during the last decade have had little effect on imports of table stock potatoes, which have declined steadily. They averaged 184 thousand bushels annually during the 5-year period 1939-43 and in 1939 amounted to 263,000 bushels. Up to 1 million bushels annually could have entered under the lower rate of duty (37.5 cents per 100 pounds) provided for under the tariff quota¹ set by the trade agreement with Canada effective January 1, 1939.

Imports of certified seed, however, which declined under a tariff rate of 75 cents per bushel during 1931-35, have risen steadily since then. After each decrease in duty (effective January 1, 1936, and January 1, 1939, respectively) imports increased materially but in no year exceeded the tariff quotas of 750,000 bushels under the 1936 trade agreement with Canada and of 1.5 million bushels under the 1939 trade agreement with Canada.² Imports of certified seed under the 1939 agreement quotas have averaged 943,000 bushels; they were 1.3 million bushels in 1939. Although imports increased substantially from 1930 to 1941, the ratio to United States production of seed potatoes never exceeded 10.2 percent; since 1940 it has been less than 5 percent. The decline in the proportion since 1940 has been due chiefly to increased domestic production, although there has been a small decrease in imports.

POST-WAR SHORT TERM

Potatoes are among the agricultural commodities which the United States has produced in greater quantity to meet wartime food requirements. From a pre-war average of 361 million bushels annually (1937-41) production rose to 465 million and 379 million bushels in 1943 and 1944, respectively. After the war, however, demand for

¹ A record Canadian crop in 1944 and high potato prices in the United States resulted in abnormally high imports during the 1944-45 crop year. The agreement-rate quota (1 million bushels) was filled within 3 weeks. Up to February 1, 1945, an additional 2.1 million bushels had entered which were dutiable at the full rate of 75 cents per 100 pounds.

² The tariff rate quota on seed potatoes was filled during the 1944-45 quota year. Up to February 1, 1945, 224,203 bushels had entered which were dutiable at the full rate of 75 cents per 100 pounds.

this commodity is expected to decrease substantially. The wartime demand for potatoes for dehydration (22 million bushels annually) may be expected to fall to negligible proportions. The feeding of liberated countries in the immediate post-war period will probably not provide any substantial offset for the reduction in military and lend-lease purchases. Per capita consumption of potatoes by servicemen will probably decline as they return to civilian life.

Production of potatoes may tend to average somewhat higher than their consumption, as readjustment in production may be delayed, particularly in view of the Government policy of supporting potato prices for 2 years after the war. Imports may decline unless the price support measures cause prices here to be materially higher than those prevailing in Canada unless some action is taken to regulate imports in this situation.

POST-WAR LONG TERM

Consumption, Production, and Imports

Despite the growth in population, it seems unlikely that consumption and production of potatoes will be much, if any, in excess of 350-370 million bushels annually.

Per capita income at 1939 level.

Duty as in 1939.—With consumption at the rate indicated above, production may be 350-370 million bushels, valued at 280-300 million dollars, imports may amount to, say, 300,000-700,000 bushels of table stock potatoes and 1-1½ million bushels of certified seed potatoes. On the assumption of 1939 prices they would probably be valued at 300,000-700,000 dollars and 1-1½ million dollars, respectively.

Duty reduced by 50 percent.—With this reduction in duty, table stock imports would not be expected to increase appreciably, but imports of certified seed potatoes might rise to a volume of, say, 1½-1¾ million bushels, valued at 1¼-1½ million dollars if the quota should be removed. Production might be 350-370 million bushels, valued at 280-300 million dollars.

Duty increased by 50 percent.—With this duty increase, imports might fall as low as, say, 100,000-200,000 bushels of table stock potatoes, valued at \$100,000-\$200,000, and ½-1 million bushels of certified seed potatoes, valued at ½-1 million dollars. Production might be 350-370 million bushels, valued at 280-300 million dollars.

Per capita income 75 percent higher than in 1939.

As per capita consumption of potatoes tends (if anything) to diminish as consumer income rises, the total quantity consumed at this level of national income would be no higher, or possibly a little lower, than with national income at the 1939 level. Production then might continue to be 350-370 million bushels, valued at 420-444 million dollars. There is, moreover, little reason to expect that imports would be materially different in quantity from imports at the lower level of national income discussed above. If prices are somewhat higher, the value of both consumption and imports might be a little, but not greatly, higher.

Exports

United States exports of potatoes are confined almost exclusively to Canada and countries to the south, of which Cuba, Panama, and at times Argentina, are the most important. Until the outbreak of the present war, exports to the Philippine Islands had also been substantial. Most European countries have quarantine restrictions which virtually close their markets to potatoes from the United States. It seems likely that exports will, in most post-war years, have about the same volume as in pre-war years.

Employment

It is estimated that about a quarter of a million people earn their livelihood from the production of potatoes and about one-half million depend upon them for an important share of their income. There does not appear to be much likelihood of any significant change in the employment in potato production under any of the assumptions made in Senate Resolution 341.

**TOMATOES, NATURAL STATE
(GROWN OUTDOORS, DECEMBER-MAY)**

<i>Tariff paragraph</i>	<i>Commodity</i>	<i>Rate of duty</i>	<i>Equiva- lent ad valorem (1939)</i>
772-----	Tomatoes, natural state:		
	General-----	3¢ per lb-----	97%.
	Cuba:		
	March-November-----	2.4¢ per lb-----	142%.
	December-February-----	1.8¢ per lb-----	102%.

NOTE.—The Tariff Act of 1930 preferential rate on Cuban tomatoes was 2.4 cents per pound, which was reduced on Cuban imports during the period December to February of each year to 1.8 cents per pound, effective September 3, 1934, pursuant to the Cuban trade agreement. Pursuant to the trade agreement with Mexico, effective January 30, 1943, the general rate was reduced to 1.5 cents per pound, by virtue of which Cuban tomatoes became entitled to a rate of 1.2 cents per pound throughout the year; these rates are to be increased after the termination of the war emergency.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production, ¹ December 1938 through May 1939			Imports	Apparent con- sump- tion	Ratio of imports to con- sumption
	Total ²	For ex- port	Produc- tion for domestic market ³			
Quantity (1,000 pounds).....	306,552	7,655	298,897	52,029	351,526	Percent 15
Value (\$1,000).....	14,834	302	14,522	⁴ 1,137		
Unit value (cents per pound).....	4.8	3.9	4.9	2.2		

¹ December 1938 through May 1939.

² Total production in all months of the year for marketing fresh amounted to 1.4 billion pounds.

³ Exclusive of hothouse production.

⁴ Foreign value.

This report deals only with fresh outdoor-grown tomatoes marketed during the months December-May.¹ United States production of

¹ A considerable quantity of hothouse tomatoes are also consumed during this period but production figures are not available. Furthermore, prices for such tomatoes are usually 30 to 100 percent higher than for outdoor tomatoes.

tomatoes marketed during this period represents about 20 percent of the total production for marketing fresh and takes places chiefly in Florida and the Imperial Valley of California.

The rate in the Tariff Act of 1930 was 3 cents per pound on imports from countries other than Cuba and 2.4 cents per pound on imports from Cuba. Under the trade agreement with Cuba, effective September 3, 1934, a rate of 1.8 cents per pound was established for imports from Cuba in the months December through February. Average annual consumption during the months December through May rose 19 percent between the two 4-year periods 1931-34 and 1935-38, while at the same time total imports declined 3 percent. For the duration of the wartime emergency, the trade agreement with Mexico, effective January 30, 1943, reduced for the entire year the duty on tomatoes coming from countries other than Cuba from 3 to 1.5 cents per pound, and the duty on those coming from Cuba to 1.2 cents per pound.

The trend of consumption of the tomatoes under consideration has been upward, but consumption has varied widely from year to year; it averaged 304 million pounds annually, 1936-40, ranging from 251 to 361 million pounds in 1937 and 1938, respectively. Although the demand is influenced by the level of consumer income, changes in supply resulting largely from sharply varying sizes of the crops harvested are primarily responsible for annual fluctuations in consumption.

Domestic production of outdoor-grown winter tomatoes, though averaging 232 million pounds annually, 1936-40, ranged from 156 million pounds in 1936 to 307 million pounds in 1939. The effects on consumption of variations in the harvest are only partially mitigated by the practice of marketing only the better grades in years of large crops and both the better and inferior grades in years of short crops. In 1939, when the domestic crop was unusually large, only the better grades were marketed, imports were comparatively small, and total consumption was unusually large, amounting to 353 million pounds. In the following year, when the domestic crop was a third smaller than in 1939, and both good and inferior grades were marketed, total domestic consumption, notwithstanding a larger national income, fell to 293 million pounds although imports were almost double those of 1939.

During the 5-year period 1936-40, imports averaged 76 million pounds annually, a decline of 7 million pounds compared with the preceding 5-year period, and supplied on the average 25 percent of consumption of outdoor-grown tomatoes in the months December-May. However, the ratio of imports to consumption varies widely from year to year because of periodic short and large crops in this country. In 1939, imports were abnormally low and supplied only 15.3 percent of domestic consumption. Mexico was the chief source of imports from 1929 through 1933, in 1937, and from 1941 through 1943 when the shipping shortage practically eliminated Cuba from the domestic market. In other years Cuba has been the chief source.

Because of the marked fluctuations from year to year in domestic production, imports, and consumption of winter tomatoes, the discussion below on the post-war estimates assumes average weather in the producing areas in the United States, and, therefore, about average consumption, production, and imports. In years of abnormally short domestic crops, consumption would be lower and imports

higher than the estimates indicate. On the other hand, in years of abnormally large domestic crops, consumption and production would be higher and imports lower than the estimates indicate.

POST-WAR SHORT TERM

It appears probable that consumption of tomatoes in the short term will be appreciably above the 5-year average (1936-40) of 304 million pounds and somewhat above the unusually large consumption of 1939. Although prices may be lower than those obtained in 1943 they may average about double those obtained in 1939. Both United States production and imports may be expected to increase over the pre-war level in response to the greater consumption. Resumption of normal shipping from Cuba may offset to some degree the probable decline in the comparatively large imports from Mexico during the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty same as in 1939.—Owing to population growth and improvement in distribution (air freight), consumption will probably rise 5-10 percent above 1939, or 20-25 percent above the pre-war average (1936-40) and will probably total as much as 380 million pounds. Imports would probably, in an average year, supply something like 25 percent of consumption and thus amount to about 95 million pounds, with a foreign value of about 2.1 million dollars, assuming prices to be about the same as in 1939. Domestic production under these conditions would be approximately 285 million pounds, valued at 13.7 million dollars.

Duty reduced by 50 percent.—As imports are a substantial source of supply, under a reduced duty consumption may tend to increase somewhat and may amount to 400 million pounds. Imports may supply a somewhat higher proportion of consumption, about 35 percent, and amount to about 140 million pounds, with a foreign value of 2.8 million dollars. Due to lower prices and increased imports, production for the domestic market may be somewhat lower than with the duty the same as in 1939, say, about 260 million pounds, valued at 11.7 million dollars.

Duty increased by 50 percent.—It appears likely that an increase in the duty would tend to lower imports, and consumption may thus amount to about 370 million pounds. Imports may, under these conditions, supply about 15 percent of consumption and may be 55 million pounds, with a foreign value of 1.1 million dollars. Domestic tomato prices may be somewhat higher and production for the domestic market rise to about 315 million pounds (85 percent of consumption), valued at 16.4 million dollars.

Per capita income 75 percent higher than in 1939.

Duty same as in 1939.—Under the impetus afforded by increased consumer income, consumption may be substantially greater than in 1939, say, about 540 million pounds. Imports may supply about 25 percent of consumption, or 135 million pounds, with a foreign value of 4.7 million dollars. Assuming an increase in domestic acreage of 10 percent in response to improved prices, production for the

domestic market might rise to about 405 million pounds, valued at 28.4 million dollars.

Duty reduced by 50 percent.—Such a reduction in duty may tend to lower the price and increase consumption to, say, 585 million pounds. Imports, under these conditions, may increase to 35 percent of consumption, or 205 million pounds, with a foreign value of 7.7 million dollars. Production for the domestic market may thus tend to be somewhat lower than it would be with the 1939 rate of duty and amount to 380 million pounds, valued at 24.7 million dollars.

Duty increased by 50 percent.—The ratio of domestic production to imports would tend to increase somewhat in meeting consumption, which because of a somewhat higher price resulting from the increased rate of duty, may be perhaps 520 million pounds. Under these conditions, imports may supply about 15 percent of consumption and amount to 78 million pounds, with a foreign value of 2.5 million dollars, and production to about 442 million pounds, valued at 32 million dollars.

Exports

United States exports of fresh tomatoes go largely to Canada. Exports averaged 4 million pounds annually in pre-war years (1936-40) and represent less than 2 percent of consumption of tomatoes marketed during the import season. Exports might increase by 50 percent with a higher world income but would still represent a small proportion of consumption.

Employment

Outdoor-grown tomatoes for marketing fresh are generally grown together with other truck crops. Average labor requirements to produce an acre of tomatoes is estimated to be 190 man-hours, and the 1939 crop of 43,700 acres represented an equivalent of 3,460 man-years. This might be increased as much as 10 percent in the post-war long-term period.

CANNED TOMATOES

Tariff paragraph: 772.
Commodity: Canned tomatoes.
Rate of duty: 50% ad val.

NOTE.—The above rate, which is that fixed in the Tariff Act of 1930, was reduced to 25 percent, effective November 15, 1941, pursuant to the trade agreement with Argentina, with reservation of the right to withdraw or modify the reduction after termination of the war with Germany.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	607,267	2,886	604,431	55,400	749,831	Percent 7.4
Value (\$1,000).....	34,188	148	34,040	2,232		
Unit value (cents per pound).....	4.9	5.2	4.9	4.0		

Foreign value.

United States consumption of commercially canned tomatoes in the 4-year pre-war period 1936-39 averaged 756 million pounds annually, of which 58 million pounds, or 7.7 percent, were imported. Consumption per capita in this period was 5.8 pounds, compared with 5.5 pounds in the depression period 1931-35; in the 9-year period 1922-30, per capita consumption had been about 7 pounds. The decline in per capita consumption in later years was probably caused in large part by the greater use of out-of-season fresh tomatoes, tomato juice, and tomato paste.

Domestic commercial production of canned tomatoes increased from 714 million pounds in 1922-25 to 757 million in 1926-30; it declined to 607 million in 1931-35, but increased to 700 million pounds in 1936-39. The unit value of domestic production, according to biennial census returns, although as low as 4.5 cents per pound in 1933, remained fairly uniform at 4.9 and 5.0 cents per pound throughout the 1930's.

Imports, virtually all of which have come from Italy, increased from an average of 58 million pounds in 1923-25 to 100 million in 1926-30; declined (after an increase in duty from 15 to 50 percent ad valorem) to 81 million in 1931-35 and to 58 million in 1936-39. The import price (foreign value) during these 4 periods was 4.9, 5.3, 3.6, and 3.9 cents per pound, respectively, and the highest average annual total value of imports was 5.2 million dollars in the 1926-30 period; this declined to 2.3 million dollars annually in 1936-39.

POST-WAR SHORT TERM

Soon after the war, domestic consumption of canned tomatoes, if resumed at the pre-war rate, would total about 800 million pounds annually. Imports may be very small, perhaps not more than 1 percent of consumption. A number of factors, difficult to foresee or measure, will affect imports. It may be assumed that imports will come principally from Italy as before the war. However, after the First World War, it took 5 or 6 years for canned tomatoes from Italy to come back into United States markets in full pre-war strength. Similar delays may again be experienced. On the other hand, canned tomatoes were an important Italian export commodity. Hence, special efforts may be made in spite of any food shortage to regain certain foreign markets. All things considered it seems likely that imports of canned tomatoes will be small for some time after the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

It is assumed, in view of the increasing competition between canned tomatoes and other tomato products, that per capita consumption of canned tomatoes will not increase and that it will be about the same as in 1939. As to imports, many of the former consumers, mostly Italians of the older generation and others, will have switched over permanently to the domestic pack. Although considerable demand may continue both among Italian nationals and native Americans, imports are likely to be much less than before the war, perhaps 50 percent less.

Per capita income at 1939 level.

Duty as in 1939.—Total consumption at the pre-war per capita of 5.8 pounds would be about 835 million pounds, of which 25 million pounds or 3 percent might be supplied by imports which, at 4 cents per pound, would have a foreign value of about 1 million dollars. Production for the domestic market might amount to 810 million pounds, which at 1939 prices of 4.9 cents per pound, would have a value of approximately 40 million dollars.

Duty reduced by 50 percent.—Imports might be nearer those in 1939 or 5 percent of consumption, and might total 40 million pounds, with a foreign value of 1.6 million dollars. Production for the domestic market might then approximate 795 million pounds, with a value of about 39 million dollars.

Duty increased by 50 percent.—Imports might be about 2 percent of consumption or about 15 million pounds with a foreign value of about \$600,000. Production for the domestic market might then be 820 million pounds, valued at about 40 million dollars.

Per capita income 75 percent higher than in 1939.

Although consumer income has not been a material factor in determining the consumption of canned tomatoes, it is assumed that a substantial increase in income might increase annual per capita consumption to 6 pounds, which would indicate an annual consumption in this country of imported and domestic canned tomatoes of about 865 million pounds.

Duty as in 1939.—Imports might share in the increased domestic consumption and amount to about 3 percent of consumption or to about 30 million pounds, which, allowing for an increase in price over 1939 to 4.5 cents per pound, would have a foreign value of approximately 1.4 million dollars. Production for the domestic market would then be about 835 million pounds, which, at an increase in price to 5.5 cents per pound, would have a value of approximately 46 million dollars.

Duty reduced by 50 percent.—Imports might increase to about 5 percent of consumption, or to 45 million pounds, with a foreign value of about 2 million dollars. Production for the domestic market then would total 820 million pounds, with a value of approximately 45 million dollars.

Duty increased by 50 percent.—Imports might not exceed 15 million pounds, or 2 percent of consumption, with a foreign value of \$675,000. Production for the domestic market then might approximate 850 million pounds, with a value of 46.7 million dollars.

Exports

Although exports increased enormously during the present war, before the war they averaged only about 2 million pounds annually, valued at \$140,000; during 1926-30 they averaged 5.5 million pounds, and in 1923 had been as high as 9 million pounds. More than half of the large exports of the early 1920's went to Cuba, a trade now virtually lost because of the increased import duties of that country. Of the 2.8 million pounds exported in 1939, the United Kingdom took 40 percent, and the remainder was widely distributed. Although exports may continue unusually large for some time after the

war, eventually, under a 1939 level of income, they may decline to the 1939 level of about 3 million pounds, with an approximate value of \$210,000; or, if world income levels are high and world trade barriers do not prevent it, increase to 5 million pounds, with an approximate value of \$400,000.

Employment

The Census gives the total number of wage earners employed in fruit and vegetable canneries. As the same canneries handle many kinds of fruits and vegetables, no figure or estimate is available of the number employed in canning tomatoes alone.

Canners of tomatoes and processors of other tomato products consume 60 percent of the United States tomato crop. In 1939, 358,000 acres of tomatoes were grown for canning and processing alone, which at 105 man-hours per acre, makes a total of approximately 4.7 million 8-hour man-days for growing the crop. As canners use about 40 percent of this crop, growing the canning crop alone required about 1.9 million man-days or 6,300 man-years.

TOMATO PASTE

Tariff paragraph: 772.

Commodity: Tomato paste and sauce, virtually all paste; sauce, if any, negligible.

Rate of duty: 50 percent ad val.

NOTE.—The rate on tomato paste and sauce was reduced to 25 percent ad valorem, effective November 15, 1941, pursuant to trade agreement with Argentina, with reservation of the right to modify or withdraw the reduction after termination of the war with Germany.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	81,983	3,848	78,135	7,146	85,281	Percent 8.4
Value (\$1,000).....	6,105	248	5,857	1,567		
Unit value (cents per pound).....	7.3	6.5		7.9		

¹ Foreign value.

In 1939, United States consumption of tomato paste amounted to 85 million pounds, of which 7 million, or 8.4 percent consisted of imports, all from Italy. Exports amounted to nearly 4 million pounds. Data on consumption and production before 1937 are incomplete, but it appears that there had been a rapid increase in both.

Domestic production in 1939 amounted to 82 million pounds, valued at 6 million dollars. It had been stimulated by the cessation of imports during the First World War, subsequent food embargoes imposed by the Italian Government, heavy rejections of imports under the pure-food law, and the higher duties imposed in the Tariff Act of 1922.

Imports declined from a high of 18 million pounds in 1925 to a low of 7 million in 1939. During the same period the import price

(foreign value) rose from 9.4 cents per pound in 1923-25 to 10.2 cents in 1926-30 largely because of the better quality of imports, which were entered after a series of rejections under the pure-food law; it then declined to an average of 7.6 cents for the period 1931-39. Both imports and import prices declined only slightly during the worst depression years.

POST-WAR SHORT TERM

Although total consumption in the immediate post-war period may be up to 90 million pounds, it will have to be supplied almost entirely by domestic production, as it is doubtful whether there will be a considerable revival of imports from Italy. Tomato paste, unlike canned tomatoes, is a standard article of diet among the people of Italy, and export embargoes may again be placed on it. It will be difficult also for the imported paste to regain the United States market in view of its displacement by the domestic product, which has long been manufactured here especially for the trade among people of Italian descent. There may be some imports from or exports to Canada, depending on the price situation in each country, but the trade will be small. There may also be some imports from Argentina, with which trade developed during the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

Regardless of the assumed level of national income, consumption in the post-war long term may be in the neighborhood of 95 million pounds.

Duty as in 1939.—Imports may increase again so that they may supply about 2.5 percent of consumption, totaling about 2.4 million pounds which, at 7.5 cents per pound, may have a foreign value of about \$185,000. Domestic production may then supply about 92.5 million pounds which, at a price of 7 cents per pound, would have a value of 6.5 million dollars.

Duty reduced by 50 percent.—Imports might increase 20 percent above what the trade would be at 1939 rates of duty and approximate 3 percent of consumption, or about 3 million pounds, with a foreign value of \$225,000. Production for the domestic market might then be about 92 million pounds, with a value of about 6.4 million dollars.

Duty increased by 50 percent.—Imports might decline about 50 percent to about 1.5 million pounds, or less than 2 percent of consumption, with a foreign value of \$105,000. Production for the domestic market would then approximate 93.5 million pounds, with a value of about 6.6 million dollars.

Exports

In 1939, exports of tomato paste amounted to 3.8 million pounds, valued at \$248,000. During the war they have been as high as 10 million pounds. There may be a gradual increase as compared with 1939 as the highly concentrated character of the product makes it more suitable for foreign trade than canned tomatoes.

Employment

No data are available. (See section on canned tomatoes.)

TURNIPS AND RUTABAGAS

Tariff paragraph: 773.

Commodity: Turnips and rutabagas.

Rate of duty: 12½¢ per 100 lbs.

Equivalent ad valorem (1939): 16%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 25 cents per 100 pounds, which was reduced to 12½ cents, effective since January 1, 1936, pursuant to the first and second trade agreements with Canada.

GENERAL

Data on United States imports for 1939 are given below:

Quantity (1,000 pounds).....	107, 689
Value (\$1,000).....	1 839
Unit value (cents per pound).....	0. 8

¹ Foreign value.

Turnips and rutabagas are relatively low-priced vegetables grown for both human food and livestock feed. Adequate statistics on domestic production are not available. It is estimated that about half the domestic production is utilized as livestock feed and the balance consumed as human food, chiefly on farms. Most of the commercial crop is produced in Minnesota, Washington, Wisconsin, Virginia, and locally around the larger consuming centers.

Imports consist almost entirely of rutabagas, practically all of which are supplied by Canada and enter principally in the large northeastern markets. Imported rutabagas, all of which are used for human food, are generally of uniformly high quality and command a premium in price. During the period 1931 to 1935 imports ranged between 89 and 99 million pounds. After the duty was reduced 50 percent (25 to 12½ cents per 100 pounds) under the trade agreement with Canada, January 1, 1936, imports rose and ranged between 108 million and 140 million pounds. Under the impetus afforded in 1943 by a sharply increased price in the United States, double that of 1939, and inadequate domestic supplies of potatoes in the spring of 1943, imports rose to 197 million pounds.

In view of the absence of adequate data concerning consumption and domestic production, estimates for the post-war period are limited to imports.

POST-WAR SHORT TERM

Since the imports consist of a carefully graded quality product, which responds to changes in prices in the United States, it would appear that they may be entered in comparatively large volume during the short-term period.

POST-WAR LONG TERM

Consumption, Production, and Imports

A 50-percent decrease or increase in duty would mean an increase or decrease of 6¼ cents per 100 pounds which would probably have some, although not a great, effect upon imports.

Per capita income at 1939 level.

Duty same as in 1939.—Because of the larger population, imports may be expected to be about 10 percent larger than in 1939, or close to 120 million pounds, with a foreign value of approximately \$960,000.

Duty reduced by 50 percent.—Imports may increase about 20 percent over 1939 to, say, 130 million pounds, with a foreign value of about 1 million dollars.

Duty increased by 50 percent.—The effect of the increase in duty would be about offset by the effect of the increase in population. Imports might thus be about the same as in 1939, or 108 million pounds, with a foreign value of about \$840,000.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Under the impetus of increased prices in the United States, imports of rutabagas may rise about 40 percent over 1939; that is, to about 150 million pounds, with a foreign value of about 1.8 million dollars.

Duty reduced by 50 percent.—Imports may be about 50 percent higher than in 1939, or about 160 million pounds, with a foreign value of about 1.9 million dollars.

Duty increased by 50 percent.—Imports might be about 30 percent over 1939, or about 140 million pounds, with a foreign value of about 1.7 million dollars.

Exports

Exports of turnips and rutabagas have been negligible and no important change is foreseen in this trade in the post-war period.

Employment

It is not possible to estimate employment for these products, as they are generally produced by part-time farm labor and adequate statistics of production and acreage are not available.

SAUCES

Tariff paragraph: 775.

Commodity: Sauces, n. s. p. f.

Rate of duty: 35% ad val.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Thin soy: ¹						<i>Percent</i>
Quantity (1,000 pounds).....	500		500	11,727	12,200	96
Value (\$1,000).....	20		20	² 367		
Unit value (per pound).....	\$0.04		\$0.040	\$0.031		
Miscellaneous sauces: ³						
Quantity (1,000 pounds).....		2,558		2,050		
Value (\$1,000).....	5,448	381	5,067	² 138	5,205	2.6
Unit value (per pound).....		\$0.149		\$0.067		

¹ Imports from China and Japan only, virtually all of which consist of thin soy.

² Foreign value.

³ Imports from countries other than China and Japan, consisting of miscellaneous high-priced sauces.

In 1939, United States imports of sauces had a total value of \$505,000, of which about 73 percent consisted of thin soy sauce from China and Japan, and 27 percent miscellaneous sauces from European countries and India.

Thin soy.—In 1939, total United States consumption of thin soy approximated 12 million pounds, of which probably less than 500,000 pounds were manufactured in the United States. Imports were valued at \$367,000 and domestic output probably at \$20,000 to \$25,000. Imports from Japan were about three times as large in quantity as those from China and about four times as great in value; imports from Japan averaged 3.3 cents per pound and those from China, 2.5 cents. Although United States output in 1939 was almost negligible, by 1943 it was estimated at about 5 million pounds valued at \$225,000.

Miscellaneous sauces.—In 1939, United States consumption of miscellaneous sauces (excluding tomato sauces valued at 25 million dollars) had a value of approximately 5.2 million dollars. Production was valued at 5.5 million, exports at \$381,000, and imports at \$138,000. Imports came chiefly from the United Kingdom, India, and Italy; those from the United Kingdom and India were high-priced specialties with an average value of 17 to 19 cents per pound, and those from Italy, 8 cents per pound.

In the pre-war period, the quantities of thin soy and miscellaneous sauces imported did not vary much from year to year, declining but slightly during the depression; the value, however, declined considerably.

POST-WAR SHORT TERM

Immediately after the war, imports of miscellaneous sauces from the United Kingdom, India, and Italy, the demand for which was relatively stable before the war, may come back in full pre-war quantities, although prices will be somewhat higher.

Imports of thin soy will depend largely upon the restoration of trade relations with China and Japan. In any event, imports from China may exceed those from Japan for some time to come. However, owing to the large increase in domestic production during the war, probably only about half of the pre-war imports will be needed to satisfy domestic consumption.

• POST-WAR LONG TERM

Consumption, Production, and Imports

United States consumption of miscellaneous sauces, it may be assumed, will increase at least as rapidly as the population, and imports may continue to constitute about the same percentage of total consumption as before. On the other hand, the thin soys, which before the war were virtually all imported, are likely to meet considerable competition from the domestic soy industry built up during the war. But as the imported soys have a distinctive flavor, it is likely that the demand for them will continue, but probably imports will be much reduced, possibly to half or a third of their former volume.

Per capita income at 1939 level.

Duty as in 1939.—Consumption of thin soy might increase somewhat faster than the population, possibly by 15 percent, to approximately 14 million pounds. If imports recover to half their former volume, that is, to 6 million pounds, then production would supply 8 million pounds, which, at a price of 4 cents per pound, would have a value of \$320,000; and imports at an average price of 3 cents would have a foreign value of \$180,000. Consumption of miscellaneous sauces might increase at about the same rate as the population, in which case production for the domestic market might have a value of approximately 5.6 million dollars, and imports a foreign value of \$150,000.

Duty reduced or increased by 50 percent.—As the demand for both soy and miscellaneous sauces has been relatively inelastic, changes in the duty within the 50 percent limit will probably not have a very great effect. With a reduction of the rate of duty by 50 percent, imports of the thin soy might increase to approximately \$200,000, and of the miscellaneous sauces to \$165,000; and with an increase of 50 percent, imports of the soy might be reduced to \$160,000, and those of the miscellaneous sauces to \$135,000.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Consumption might be somewhat higher than under the lower income, possibly 10 percent for both thin soy and miscellaneous sauces. Consumption of thin soy might amount to about 15.4 million pounds; of this, about 8.8 million pounds might consist of domestic production, which at 4.5 cents per pound would have a value of approximately \$500,000, and 6.6 million pounds of imports, which at 3.5 cents per pound would have a foreign value of about \$230,000. Production for the domestic market of miscellaneous sauces might have a value of 6.2 million dollars, and imports a foreign value of \$165,000.

Duty reduced or increased by 50 percent.—Although changes in the duty at somewhat higher prices might otherwise be slightly more effective than at the lower, the stable demand for the products under consideration should largely offset this. There might be an additional 10 percent increase or reduction in imports compared with the imports at the lower level of income. Changes in consumption and production, if any, would probably be small. Thus under a reduction of the duty, imports of thin soy might rise to a foreign value of approximately \$250,000 and those of miscellaneous sauces to \$180,000; and under an increase in the duty, imports of thin soy might decline to a foreign value of approximately \$210,000 and imports of miscellaneous sauces to \$150,000.

Exports

There were no exports of thin soy before the war. Whether the domestic soy can compete in foreign markets with those of Chinese and Japanese manufacture after the war cannot now be stated. It is likely, however, that exports, if any, will be small.

In the 1926-30 period, exports of miscellaneous sauces averaged \$670,000 annually; in 1931-35, they averaged \$313,000; and in 1936-40, \$426,000. Canada has been the largest market, and the major part of the decline in exports in the early 1930's was due to the

decline in exports to that country. Evidently part of it was caused by the depression and part by higher duties. It is estimated that after the war, at the 1939 level of income, exports of miscellaneous sauces will be about as large as before the war, but that under a 75 percent general increase in income, with a reduction of trade barriers, there may be as much as a 25 percent increase in exports.

Employment

The 1940 Biennial Census of Manufactures reports 11,000 persons employed by establishments engaged primarily in the manufacture of pickled fruits and vegetables and vegetable sauces and seasonings. Inasmuch as miscellaneous sauces represented nearly 6 percent of the value of the output, it may be assumed that a similar proportion of the number employed, or about 640 persons, were engaged in the manufacture of sauces alone.

ONIONS, PICKLED OR IN BRINE

Tariff paragraph: 775.

Commodity: Onions, pickled or in brine.

Rate of duty: 25% ad val.

NOTE.—The rate fixed in the Tariff Act of 1930 was 35 percent ad valorem, which was reduced to 25 percent pursuant to the trade agreement with the Netherlands, effective February 1, 1936.

GENERAL

Data on United States imports for 1939 are given below:

Quantity (1,000 pounds).....	2,364
Value (\$1,000).....	1135
Unit value (per pound).....	\$0.057

¹ Foreign value.

Onions, pickled or in brine consist of the small sizes, either pickled in vinegar and put up in bottles for sale by retailers, or preserved in brine and stored and shipped in bulk, to be pickled and bottled later by wholesale food processors.

Statistics of United States consumption and production are not available, but it is known that there is considerable production around Chicago, with some also in New York State and Connecticut. There is, however, no domestic production of the very small sizes known as pearl onions, all of which are imported. There is so much hand labor connected with the preparation and pickling of small-size onions that they can be prepared much more cheaply abroad than in this country. The value of imports (foreign value in brine) has never been as much as 1 percent of the farm value of the total United States onion crop.

Imports have consisted mostly of onions in brine for pickling and bottling in the United States. Pearl onions enter already pickled and bottled. Average annual imports in the 4-year pre-war period, 1936-39, amounted to 1.9 million pounds, valued at \$124,000, or 6.5 cents per pound. Imports were less than 1 million pounds in 1935, but after the duty was lowered from 35 to 25 percent ad valorem in the agreement of 1936 with the Netherlands, they increased to 2.4 million pounds by 1939. Imports were about 20 percent higher in 1939 than the 4-year average. They seemed somewhat sensitive to changes in consumer income.

In the pre-war period, an average of 89 percent of the imports came from the Netherlands and 9 percent from Japan; China, Italy, and Greece supplied smaller quantities.

POST-WAR SHORT TERM

Depending upon the extent of the recovery of the industry in the Netherlands, imports in the period immediately following the war may recover to their pre-war figures.

POST-WAR LONG TERM

Imports

In view of the absence of adequate data on United States consumption and production, estimates for the post-war period are limited to imports. There will probably be a continuance of the pre-war upward trend in imports, at least sufficient to take care of the larger population.

Per capita income at 1939 level.

Duty as in 1939.—Imports might increase about 15 percent over the pre-war average, or to about 2.2 million pounds. At a price of 6 cents per pound, imports might have a foreign value of approximately \$130,000.

Duty reduced by 50 percent.—Imports might increase by an additional 25 percent to 2.8 million pounds, with a foreign value of approximately \$165,000.

Duty increased by 50 percent.—With an ad valorem rate of duty of 37½ percent, imports would likely decline 25 percent below the level of 1939, and amount to approximately 1.6 million pounds, with a foreign value of about \$100,000.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Imports might increase as much as 25 percent over those under the lower level of income, or to approximately 2.8 million pounds, which at a somewhat higher price, possibly 8 cents per pound, would have a foreign value of about \$220,000.

Duty reduced by 50 percent.—Imports might increase by an additional 25 percent, or to approximately 3.4 million pounds, with a foreign value of about \$275,000.

Duty increased by 50 percent.—Imports might decline by 25 percent from those under the duty as in 1939, to about pre-war levels; 2 million pounds at the same price as above would have a foreign value of about \$160,000.

Exports

Statistics of exports, if any, are not available. Exports of all pickles in 1939, most of which consisted of cucumber pickles, totaled about 2 million pounds with a value of \$200,000. In view of probable competition with countries where labor costs are much lower, it is not likely that exports of pickled onions alone will be of any importance after the war.

Employment

It is not possible to estimate employment in this industry as the total production, which constitutes but a small fraction of the pickle and sauces industry, is not known.

ENDIVES AS CRUDE CHICORY (NATURAL STATE)

Tariff paragraph: 776.

Commodity: Endives as crude chicory (natural state).

Rate of duty: 1½ cents per pound. *Equivalent ad valorem (1939):* 13%.

NOTE.—For a number of years after enactment of the Tariff Act of 1930 endives in their natural state were classified as vegetables at the Tariff Act of 1930 rate of 50 percent ad valorem. That rate, as applied to endives, was reduced to 35 percent, effective May 1, 1935, pursuant to the Belgian trade agreement. As a result of a court decision endives became dutiable as crude chicory in 1936 at the rate of 1½ cents per pound (reduced from 2 cents per pound) pursuant to the Belgian agreement.

GENERAL

Data on United States imports for 1939 (apparent consumption) are given below:

Quantity (1,000 pounds).....	1,465
Value (\$1,000).....	169
Unit value (cents per pound).....	11.5

¹ Foreign value.

The type of endives considered in this report is the so-called French endive or Witloof chicory. It is used principally as a fancy salad green by exclusive hotels and cafes. The demand for such endives is mainly confined to some of the larger centers, particularly New York City. In pre-war years the domestic market depended almost entirely upon imports from Belgium.

As domestic commercial production of endives is probably very small consumption is supplied almost entirely by imports. The crop is grown to a very limited extent on truck farms and in hothouses in New York, New Jersey, and Illinois, but statistics of domestic production are not available. Although averaging 1.6 million pounds annually in earlier years, imports declined during the 1931-35 period to an average of 1.3 million pounds, and rose to an average of 1.5 million pounds during the next five years—1936-40. Imports of endives ceased after the occupation of Belgium by Germany.

Consumption of endives tends to vary with consumer income. However, it is not likely that consumption will increase in the near future. The public taste for such an article is likely to be lessened by its continued absence from the market for several years. Moreover, the increasing use of domestically produced winter vegetables may adversely affect the market for endives.

POST-WAR SHORT TERM

It seems probable that consumption of endives in the short-term will not exceed that of 1939 despite the growth in population and the higher national income. Several years may be required to recapture the market for this specialty.

POST-WAR LONG TERM

It is doubtful whether domestic production of endives will be much greater than in 1939. Few in this country may be expected to produce endives in response to the limited demand for this product from a small number of hotels and restaurants. Consumption as in the past will probably be largely dependent upon imports. As the duty is low (1½ cents per pound, equivalent to 13 percent ad valorem in 1939) a 50-percent reduction or increase in the rate would probably not cause a great increase or decrease in the volume of imports.

Per capita income and prices at 1939 level.

Consumption of endives may be only slightly higher than in 1939 despite the growth in population. Imports may be 1.3-1.6 million pounds, with a foreign value of \$150,000-\$184,000.

Per capita income 75 percent higher than in 1939.

Consumption of endives may exceed that of 1939 by about 25-40 percent. Imports may be 1.8-2.0 million pounds which, with a foreign price 20-25 percent above 1939, may have a foreign value of \$248,000-\$288,000.

COCOA, CHOCOLATE, AND COCOA BUTTER

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
777-----	Cocoa, chocolate, and cocoa butter;		
	Cocoa and chocolate:		
	Unsweetened.....	1½¢ per lb.....	12.6%.
	Sweetened:		
	In bars or blocks, 10 lb. or more.	2¢ per lb.....	12.9%.
	In any other form:		<i>Equivalent specific (1939)</i>
	Valued at 10¢ or more per lb.	20% ad val.....	6.5¢ per lb.
	Valued at less than 10¢ per lb.	40% ad val.....	2.3¢ per lb.
	Cocoa butter.....	12½% ad val....	2.5¢ per lb.

NOTE.—The above indicated rates of duty are 50 percent less than those provided for in the act of 1930, with the exception of sweetened cocoa and chocolate valued at less than 10 cents per pound (other than in bars or blocks weighing 10 pounds or more) for which the rate of 40 percent ad valorem remains unchanged. The reduced rates have been in effect since February 1, 1936, pursuant to the trade agreement with the Netherlands.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	680.2	19.3	660.9	4.5	665.4	<i>Percent</i> 0.7
Value (\$1,000).....	66,357	2,583	63,774	² 620		
Unit value (cents per pound).....	9.8	13.4	9.6	13.9		
Persons employed (number).....	6,464					

¹ Data for domestic production are exclusive of sweet chocolate with nuts, and milk chocolate, plain and with nuts, which are classed as confectionery. However, the chocolate coatings used in confectionery are included.

² Foreign value.

Cocoa beans are the raw material from which cocoa, chocolate, and cocoa butter are manufactured. Cocoa beans are not produced in the United States. They are imported free of duty and come chiefly from the Gold Coast, Nigeria, Brazil, and the Caribbean countries. (See separate report on cocoa beans.)

Chocolate is the ground, roasted cocoa bean. Under the pure food laws of the United States it must contain at least 50 percent cocoa butter; that is, practically all the cocoa butter contained in the bean.

The plastic mass (chocolate liquor) which issues from the heated grinding mills hardens when cooled and is usually made into 10-pound blocks, which are either marketed to confectioners and others, or used by the manufacturer in the production of chocolate bars, candy, or other products. The chocolate blocks are known to the trade as chocolate coatings.

Cocoa is the "cake" obtained when some of the cocoa butter is pressed from the chocolate liquor and usually contains 22 percent or less of cocoa butter. The "cocoa cake" is hard and must be ground before use. Most of it is used by the manufacturer in combination with other materials in the preparation of cocoa, which is sold in cans for household beverage uses.

If sweetened cocoa and chocolate are mixed with substances other than sugar, such as milk, nuts, fruit, etc., the product is classed as confectionery and is dutiable under paragraph 506.

Nearly two-thirds in quantity of the output of the domestic cocoa and chocolate industry (exclusive of confectionery) in 1939 was chocolate, sweetened and unsweetened, about one-fourth was powdered cocoa, and less than 10 percent was cocoa butter. On the basis of the apparent consumption of cocoa beans by the industry, the consumption in 1939 was about 10 percent greater than the annual average for the period 1935 to 1938.

Imports in 1939 consisted predominantly of unsweetened cocoa and chocolate. The aggregate imports in 1939 were about 24 percent greater than the average for the years 1935 to 1938; in none of these years were they equivalent to as much as 1 percent of the domestic output. The average unit value of the imports in 1939 was only slightly less than the average of the imports during the preceding 4 years.

The unsweetened cocoa, the principal imported item, was a high quality, specialty item; the average foreign unit value of 1939 imports of unsweetened cocoa was 11.8 cents per pound and the average value of the United States output in that year was 7.6 cents per pound. In the immediate pre-war years United States imports of cocoa and chocolate were mainly from the Netherlands. The United States imports in 1939 of cocoa and chocolate products by types were as follows:

Item	Quantity	Foreign value		Duty collected	Rate of duty	Equivalent ad valorem
		Total	Per lb.			
Cocoa:						
Unsweetened.....	1,000 lbs. 3,562	1,000 dollars 422	Cents 11.8	Dollars 53,424	1 1/2% lb...	Percent 13
Sweetened, valued at 10¢ or more per lb.	25	10	41.8	2,047	20%.....	20
Total cocoa.....	3,587	432	12.0	55,471		13
Chocolate:						
Unsweetened.....	281	36	12.8	4,221	1 1/2% lb..	12
Sweetened:						
In bars or blocks, 10 lb. or more..	172	25	15.4	3,446	2 1/2 lb....	13
In any other form:						
Valued at 10¢ or more per lb..	379	121	31.9	24,496	20%.....	20
Valued at less than 10¢ per lb..	26	2	5.8	610	40%.....	40
Total chocolate.....	858	185	21.6	32,763		13
Cocoa butter.....	15	3	20.1	367	12 1/2%.....	13
Grand total.....	4,460	620	13.9	88,601		14

United States exports of cocoa and chocolate products totaled 19 million pounds in 1939, which was more than twice the volume exported in 1937 or 1938, the average for these 2 years having been 7½ million pounds. The higher exports in 1939 were accounted for by the increase in shipments of cocoa butter, which amounted to 13¼ million pounds in this year, compared with an average of 2 million for the 2 preceding years. In 1939 the volume of exports of cocoa and chocolate products were more than four times that of imports, whereas in 1937 and 1938 they were only slightly more than twice the volume of imports. The significant fact, however, is that the United States cocoa and chocolate industry is on an export basis, though both exports and imports are small in relation to volume of production.

The United States is the predominant world producer and consumer of cocoa and chocolate products, consuming nearly 50 percent of the world's annual supply of cocoa beans before the war. (See separate section on cocoa beans.)

It is probable that the upward trend in United States per capita consumption evident during the 1920's and 1930's may be maintained. The United States may continue to be the world's leading producer and consumer of cocoa and chocolate products, and imports may continue to consist more or less of specialty products.

POST-WAR SHORT TERM

During the first few years after the war ample supplies of cocoa beans will probably be available and the domestic consumption of cocoa and chocolate products may be from 20 to 30 percent higher than in 1939. Almost all of this would be supplied by domestic production. The war-disrupted European chocolate-manufacturing industry will probably not have recovered by this time, and United States imports, which were relatively small in the pre-war years, may be even lower than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

It may be assumed that the United States per capita consumption of cocoa and chocolate products under these conditions will be possibly 10 percent greater than in 1939 in line with the pre-war trend; so that, taking into account an increase in population of about 10 percent, the total consumption would be approximately 800 million pounds. Since the volumes of both exports and imports are likely to be very small in relation to total consumption, domestic production, expressed in millions of pounds, may approximate total consumption. The assumed levels of rates of duty will have minor effects on the quantity of domestic production when so expressed and, at slightly above 1939 prices, production may have an approximate aggregate value of 80 million dollars.

Duty as in 1939.—In view of the fact that imports in 1939 were relatively large compared with those in the immediately preceding years, the volume of imports may be approximately that in 1939 or 4¼ million pounds valued at possibly \$600,000 (foreign value). This would be considerably less than 1 percent of consumption.

Duty reduced by 50 percent.—This reduction would result in rates only 25 percent as high as in the Tariff Act of 1930. Imports in the aggregate would probably not increase more than about 10 percent over those in 1939 and amount to about 5 million pounds with a foreign value of about \$670,000. Imports of some items in this class might increase more than this and others less, but in the aggregate they probably would not amount to more than 0.6 percent of domestic consumption.

Duty increased by 50 percent.—Such a change in duties would bring the rates on most items to three-fourths of the rates in effect from 1930 to 1936. On the basis of the trend of imports under the rates in the Tariff Act of 1930 compared with those under the lower rates in effect July 1, 1939, it is probable that imports at rates increased by 50 percent might aggregate approximately 4 million pounds, with a foreign value of \$540,000.

Per capita income 75 percent higher than in 1939.

It is possible that with the higher per capita income and prices, possibly 25 percent higher than in 1939, consumption per capita might increase 30 percent over that in 1939, bringing the total consumption of cocoa and chocolate products to approximately 900 million pounds. At this level of income it is also supposed that domestic production would virtually approximate consumption and the assumed changes in rates of duty would have only a minor effect on domestic values and consumption. The value of production may be about 120 million dollars, with prices perhaps 25 percent higher than in 1939.

Duty as in 1939.—Imports might equal approximately 6 million pounds, which would represent an increase of 33 percent over the relatively high imports of 1939. At the higher prices likely to prevail at this higher income, the foreign value of imports might approximate 1 million dollars.

Duty reduced by 50 percent.—Imports of cocoa and chocolate may increase only slightly and range from 6 to 6½ million pounds, with a foreign value of from 1 to 1.1 million dollars.

Duty increased by 50 percent.—Since from 85 to 90 percent of the imports of cocoa and chocolate products normally have been of items subject to specific rates of duty, the ad valorem equivalent of the duties would decline almost in proportion to increases in foreign unit values, thus reducing the relative burden of duties. Under these conditions the assumed increased rates of duty would probably not materially affect the volume of imports, which may be 5.5–6.0 million pounds, with a foreign value of 0.9–1.0 million dollars.

Exports

The United States exports of cocoa and chocolate products in 1939 amounted to 19 million pounds, which was more than twice that during any of the years 1935 to 1938. The increased exports consisted almost wholly of cocoa butter. These shipments went predominantly to the United Kingdom, Belgium, Canada, Australia, and New Zealand. When the chocolate-manufacturing industry in Europe is restored, United States exports of these products will probably again take on the pre-war pattern and represent in the neighborhood of 1 percent of the domestic production. The principal chocolate-manufacturing countries depend on imports for the supply of the chief

raw material—cocoa beans—and these are obtained from the same principal sources and presumably at about the same cost. Thus it is likely that the United States will supply about the same proportion of the foreign demand for cocoa and chocolate products in the post-war as in the pre-war years. The manufacturing of cocoa and chocolate products in the tropical cocoa-bean producing countries has not been important.

Employment

The number of persons employed in the cocoa and chocolate industry in 1939 was 6,464. This includes those engaged in producing confectionery items which are manufactured by the chocolate industry. Changes in rates of duty on cocoa and chocolate products would probably have only a minor effect on domestic output and employment in this industry. Probably as many as 9,000 persons may be employed in the domestic industry at the higher assumed level of income.

HAY

Tariff paragraph: 779.

Commodity: Hay.

Rate of duty: \$2.50 per short ton.

Equivalent ad valorem (1939): 32%.

NOTE.—The rate fixed in the Tariff Act of 1930 was \$5 per short ton. It was reduced to \$3, effective January 1, 1936, and further reduced to \$2.50, effective January 1, 1939, pursuant to the trade agreements with Canada. Hay was admitted duty-free for the relief of drought areas during August to June in 1934-35 and 1941-42, and to relieve the feed shortage during December to June 1943-44.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Appar-ent con-sumption	Ratio of imports to con-sumption
	Total	For export	For domestic market			
Quantity (1,000 short tons).....	86,305	3	86,302	48	191,588	Percent 0.05
Value (\$1,000).....	685,427	00	685,267	1,381		
Unit value (per ton).....	\$7.94	\$20.00	\$7.94	\$7.94		
Persons employed.....	(¹)					

¹ Disappearance of hay estimated by the U. S. Department of Agriculture, taking into account stocks of hay at beginning and end of year.

² Foreign value.

³ See discussion under "Employment."

Of the total hay crop produced in 1939, 31 percent was alfalfa; 26 percent, clover and timothy; 8 percent, soybean; 6 percent, Lespedeza; and the remainder, 29 percent, miscellaneous hays.

About 90 percent of the production of hay is consumed on the farms where it is grown and the remainder is sold locally or shipped by truck, rail, or water to city markets or to centers of the dairy industry. The Northeastern States are especially significant from the tariff and import standpoints. Largely because of the importance of the dairy industry in those States, their consumption of hay is large in proportion to area. Most sections of these States, although planting a large proportion of their cropland to hay, find it necessary to draw supplies from outside sources. Normally imports, practically all from Canada, come almost exclusively into this region.

Although total consumption of hay in the United States has fluctuated yearly, the annual average consumption is fairly stable; in 1926-29 it amounted to 86.3 million tons as compared with 85.2 million tons in 1937-39. The number of horses steadily declined in 1926-39 while that of cattle increased. The number of hay-consuming animal units¹ amounted to 75.5 million annually in 1926-30 and reached a peak of 85.9 million in 1933, and was 77.2 million in 1937-39. The consumption of hay per hay-consuming animal unit ranged from a low of 0.78 ton in 1934 (a drought year) to a high of 1.24 tons in 1927. In 1939 it amounted to 1.17 tons. The average of 1926-39 was 1.04 tons. By excluding the drought years from the average, consumption and the ratio of imports to consumption in 1939 may be considered about representative of pre-war years, but production was about 5 percent less than the average for that period. The difference was made up from stocks.

POST-WAR SHORT TERM

The trend of hay-consuming animal units has been upward during the war period but will probably decline from the wartime peak; it seems likely that consumption of hay will be about 5 percent higher than in 1939. Imports will probably supply about the same proportion of consumption as in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Although there have been definite cycles in the number of hay-consuming animal units in the pre-war period, it seems probable that the average consumption in the post-war period will be about 100 million tons. This quantity is somewhat lower than the 103 million tons consumed in 1942. Production would probably supply practically all consumption except relatively small quantities of imports into the Northeastern States and would amount to slightly less than 100 million tons, valued at 800 million dollars under either assumption as to the change in duty.

Duty as in 1939.—Imports seem likely to increase in about the same proportion as consumption and will probably be about 53,000 tons, or about 0.05 percent of consumption, with a foreign value of \$420,000.

Duty reduced by 50 percent.—With the duty decreased to the equivalent of about 16 percent ad valorem, imports would probably increase considerably and amount to about 100,000 tons, or about 0.1 percent of consumption, with a foreign value of \$795,000.

Duty increased by 50 percent.—With a duty increased to the equivalent of about 48 percent ad valorem, imports would probably decrease about 50 percent below 1939 to 24,000 tons, or about 0.03 percent of consumption, with a foreign value of about \$190,000.

Per capita income 75 percent higher than in 1939.

Consumption might increase about 15 percent over 1939 and be slightly above 105 million tons. Production would supply all of consumption but a fraction of 1 percent which would be imported. Prices

¹ The following factors were used to determine the number of hay-consuming animal units: milk cows, 1.0; other cattle, 0.75; sheep and lambs, 0.16; and horses and mules, 0.82.

seem likely to be about \$12 per ton. Production would amount to about 105 million tons, valued at 1,260 million dollars.

Duty as in 1939.—Imports would probably be about 55,000 tons, or about 0.05 percent of consumption, with a foreign value of about \$660,000.

Duty reduced by 50 percent.—Imports seem likely to be about 0.1 percent of consumption, or about 105,000 tons, with a foreign value of \$1,260,000.

Duty increased by 50 percent.—Imports would probably amount to about 0.03 percent of consumption, or about 32,000 tons with a foreign value of \$385,000.

Exports

Exports of hay have been insignificant and seem likely to continue to be so in the post-war period. With the exception of the crop year 1937-38, when about 111,000 tons of hay were exported to Canada, exports averaged about 2,500 tons annually in 1930-39 and went principally to Canada and Mexico.

Employment

The United States Department of Agriculture estimates that 20 hours are required to produce one acre of alfalfa and 8.3 hours to produce one acre of clover and timothy. On this basis, the equivalent of 303,000 persons fully employed all year were required to produce the 1939 crop of hay. In the post-war period about 354,000 persons would probably be required at the lower income level, and 370,000 persons at the higher.

HOPS

Tariff paragraph: 780.

Commodity: Hops.

Rate of duty: 24¢ per lb.

Equivalent ad valorem (1939): 59%.

NOTE.—The above rate is that fixed in the Tariff Act of 1930. From April 16, 1938, to April 31, 1939, the effective period of the trade agreement with Czechoslovakia (agreement was suspended April 22, 1939), hops valued at 30 cents or more per pound were dutiable at 18 cents per pound; other hops not affected. The equivalent ad valorem in 1939 for the higher-priced hops imported at agreement rates was 45 percent; at full rates, 58 percent; for the lower-priced hops, 108 percent.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	34,649	4,682	29,967	8,190	38,157	<i>Percent</i> 22
Value (\$1,000).....	8,490	1,596	6,894	² 2,066		
Unit value (cents per pound).....	24.5	34.1		27.4		
Persons employed (number).....	(³)					

¹ Marketable production of Pacific Coast States only, but it represents over 99 percent of domestic production. Does not include 2,813,000 pounds not available for marketing because of marketing agreement allotments.

² Foreign value.

³ See discussion under "Employment."

Hops are used in the brewing of beer and no significant quantities are consumed outside the malt-beverage industry. The apparent consumption of hops in 1939 was 38 million pounds, just about the same as the annual average consumption for the 5-year period 1935-39. Production, import, and export figures for 1939 were about the same as the average for the period 1935-39. Unit values in all classifications were higher for 1939 than the corresponding annual averages for 1935-39.

Following the repeal of national prohibition and until the war, imported hops ordinarily accounted for a fifth to a fourth of the total quantity used by domestic brewers. Imports averaged 8.3 million pounds annually during 1935-39 and consisted principally of seedless types. In this respect they differed greatly from most domestic hops. The imported seedless hops were considered desirable also because of their aroma and quality, and considerable prestige was attached to their "fineness."

The price of imported hops, duty-paid, has always been much higher than the domestic product and nearly all imports are blended with domestic hops. The principal sources of supply were Czechoslovakia, Yugoslavia, and Germany.

Although imports exceeded exports in 4 of the 5 years 1935-39, exports in the past have usually been greater than imports. An annual average of nearly 5 million pounds were exported during 1935-39, chiefly to the United Kingdom and Eire, which accounted for three-fourths or more of the total exports in all years except 1939.

The quantity of hops used in producing a barrel of beer has steadily decreased. In 1935 about seven-tenths of a pound per barrel represented the average ratio used by domestic brewers; by 1943 it was less than one-half pound. This downward trend will probably not continue in the post-war years, but the amount of hops used per barrel of beer probably will not return to the pre-war level.

During the war United States hops have been practically the only ones available to brewers in this country as well as in hop-deficient countries outside of Axis-controlled areas. During the period 1940-44, domestic production has shown a 20-percent increase over the preceding 5-year period, and an increased portion of the domestic output has been of seedless types. Hops have been under price control since December 1942.

POST-WAR SHORT TERM

The consumption of hops will probably be greater than in the immediate pre-war years, with domestic hops representing a higher proportion of the total than formerly. Foreign hops may be available, although in limited quantity, and their price may be relatively high. Moreover, demand for them is likely to be less than in pre-war years because of the exclusive use of domestic hops during the past few years. Total production will probably be at a high level because of the large demand for both the domestic market and for exports.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption might be in the neighborhood of 36 million pounds, on the assumption that annual beer production may total nearly 65 million barrels. The quantity of hops used for each barrel may average only about 0.55 pound as compared with 0.60 pound in 1939. Although changes in duty will probably have little effect on the total quantity of hops consumed, they may affect the price to brewers of imported hops, and also have considerable effect on the quantity and value of domestic production.

Total production, including hops for export, may range between 35 and 37 million pounds and the total value may range between 8.0 and 9.6 million dollars.

Duty as in 1939.—With the duty as in 1939, namely 24 cents a pound, imported hops probably will not be used in as great a proportion to the total as in pre-war years. Imports might represent roughly 15 percent of consumption, and thus perhaps exceed 5 million pounds. At a unit value approximating that of 1939, the total foreign value of imports would be about 1.9 million dollars. Production for the domestic market might be about 31 million pounds which, with prices at 25 cents a pound or about the same as in 1939, would have a value of about 7.5 million dollars.

Duty reduced by 50 percent.—Imports might supply about 22 percent of consumption, or about 8 million pounds. The unit value may be slightly higher than in 1939, or 38 cents a pound, because part of the reduction in duty may be absorbed by foreign sellers. Thus the total foreign value of imports may somewhat exceed 3 million dollars. Production for the domestic market may be in the neighborhood of 28 million pounds, valued at about 6.4 million dollars, assuming that prices will be somewhat lower than in 1939, or 23 cents a pound.

Duty increased by 50 percent.—Imports might not be more than 4 million pounds. Foreign unit values might tend to be a little lower than at unchanged rates of duty, or about 36 cents a pound, because of a decreased total demand for the product and because foreign sellers might lower their prices to absorb part of the duty increase. The total foreign value of imports might thus be about 1.4 million dollars. Production for the domestic market might amount to about 32 million pounds, and, at a unit farm value a cent or so higher than at duty rates as in 1939, or about 26 cents a pound, might have a total value of 8.3 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption might be about 50 million pounds, about 30 percent higher than in 1939, assuming that some 90 million barrels of beer, requiring around 0.55 pound of hops per barrel, will be produced. Duty changes by 50 percent in either direction probably would have considerable effect on the relative quantities and values of both domestic and imported hops, although little effect on total consumption.

Production for both domestic consumption and exports might be 52-55 million pounds. At unit values about double those of 1939, production might have a value of 22-30 million dollars.

Duty as in 1939.—Imports will probably supply about 15 percent of consumption, or about 7 million pounds. The foreign unit value will probably be very high, perhaps 60 cents a pound, and the total foreign value of imports might thus be about 4.2 million dollars. Production for domestic consumption might be near 43 million pounds, and, at a unit value of 50 cents per pound, have a total value of about 22 million dollars.

Duty reduced by 50 percent.—Imports might supply around 20 percent of consumption, or 10 million pounds. At a foreign unit value possibly somewhat higher than with duty as in 1939, or about 62 cents per pound, the total foreign value of these imports would be 6.2 million dollars. Production for the domestic market might be about 40 million pounds, and at the somewhat lower unit price of about 45 cents per pound, might have a total value of about 18 million dollars.

Duty increased by 50 percent.—Imports might be about 5 million pounds, supplying about 10 percent of consumption. The foreign unit value would tend to be lower than with duty as in 1939, and might be about 58 cents per pound. On this basis imports would have a total foreign value of about 2.9 million dollars. Production for the domestic market might be around 45 million pounds, and, at about 55 cents per pound, might have a value of about 25 million dollars.

Exports

Exports were much higher during the war than in the immediate pre-war period. However, large quantities went to countries formerly using European hops, and, with the return of peace, some of these markets, particularly in South America, may be lost. In this case, with world income levels approximately those of 1939, total exports may be near pre-war levels, since they would go largely to pre-war foreign buyers, and may be 5-7 million pounds, with a value of roughly 1.7-2.4 million dollars.

With world income at high levels, world consumption of hops may increase to about the same extent as in the United States. If so, foreign demand for United States hops may be much greater than would otherwise be the case and may possibly amount to 10-12 million pounds annually, with a value perhaps of 5.5-6.6 million dollars.

Employment

It is estimated that 432 man-hours are required to produce an acre of hops, with 128 hours accounting for pre-harvest labor and 304 for harvest. On the basis of the 1939 acreage (31,000 acres) the equivalent of 6,000 fully employed persons was necessary to produce the crop. Under post-war conditions, though it is possible that production of hops may be considerably increased, total employment would not increase very much, as more and more mechanical pickers are being used for harvest, decreasing the number of seasonal harvest workers required.

CAYENNE PEPPER ¹

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
781-----	Cayenne pepper:		
	Unground-----	5¢ per lb-----	49% ²
	Ground-----	8¢ per lb-----	56% ²
	Average-----		49% ²

¹ "Capsicum or red pepper or cayenne pepper," Tariff Act of 1930.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds)-----	8,000	1,146	7,146	Percent ¹ 16
Value (\$1,000)-----	600	118		
Unit value (cents per pound)-----	10.0	10.3		

¹ Production for the domestic market only. Export data for 1939 not available, but exports in that year were probably very small.

² Estimated.

³ Includes unground, 1.1 million pounds, valued at \$118,000; ground, 4,000 pounds, valued at \$576.

⁴ Foreign value.

Cayenne (or red) pepper, the fruit of pungent varieties of Capsicum, has long been one of the more important spices used in the United States. In addition to its use as a spice, cayenne is also used extensively in the manufacture of medicinal and flavoring products. During the present war consumption has increased substantially because of its use as a substitute for other spices, particularly black and white pepper, which have been scarce.

Cayenne pepper is grown in the United States in large quantities, but official statistics of production are not available. The principal centers of cultivation are in California, Mississippi, Louisiana, and South Carolina. Crude cayenne pepper, both domestic and imported, is processed and ground in the United States; very small quantities of ground pepper are imported.

Imports in 1939 of whole and ground cayenne pepper were considerably below the annual average during the years 1935-39, which was 1.5 million pounds, valued at \$119,000, with a unit value of 7.9 cents per pound. Japan was the principal pre-war source, but relatively small quantities came also from Mexico and Africa. During 1941-44 imports, nearly all from Mexico, ranged between 3.5 million and 6.3 million pounds, with a foreign value of \$425,000 to \$921,000.

The total consumption of cayenne pepper during 1935-39 probably averaged about 7 million pounds annually. Estimates from trade sources indicate that United States production during that period was about 5 million to 6 million pounds annually (unground basis), but that during the war, the crop may have increased to possibly as much as 15 million pounds. Since most cayenne pepper is ground, the total quantity, domestic and imported, ground in the United States during the war may have been as much as 20 million pounds annually.

POST-WAR SHORT TERM

Domestic consumption may be about 70 percent higher than in 1939 or about 12 million pounds annually. Domestic production may supply about 10 million pounds and imports about 2 million pounds.

POST-WAR LONG TERM

Consumption, Production, and Imports

As a result of the greater use of cayenne pepper during the war, resulting from the scarcity of other spices, spice manufacturers and important consumers, such as meat packers, may have become so accustomed to the use of cayenne that the per capita consumption after the war may be higher than in the pre-war period.

Per capita income at 1939 level.

The total domestic consumption of cayenne pepper might be approximately 25 percent higher than in 1939, or about 9 million pounds annually.

Duty as in 1939.—Production for the domestic market might supply about 7 million pounds, which at the estimated value as of 1939, would have a value of about \$700,000. Imports might supply about 22 percent of consumption, or about 2 million pounds, which at 8 cents per pound, the average foreign unit value for 1935–39, would have a total foreign value of about \$200,000.

Duty decreased by 50 percent.—Production for the domestic market might supply about 6.5 million pounds, with a value of perhaps \$650,000. Imports might supply around 28 percent of the estimated total consumption of 9 million pounds, or about 2.5 million pounds, with a total foreign value, at 8 cents per pound, of \$200,000.

Duty increased by 50 percent.—Production for the domestic market might supply about 7.5 million pounds, and imports about 1.5 million, the latter being approximately 17 percent of the estimated domestic consumption of about 9 million pounds. At the unit values as of 1939, domestic production would thus be valued at \$750,000, and imports would have a foreign value of about \$120,000.

Per capita income 75 percent higher than in 1939.

The consumption of cayenne pepper might be around 10 percent higher than at the lower income level, or about 10 million pounds annually.

Duty as in 1939.—United States production for the domestic market might be about 7.5 million pounds, valued at about \$940,000 (12.5 cents per pound). Imports might total 2.5 million pounds, supplying 25 percent of the estimated total consumption, which, at unit values 25 percent higher than the average for 1935–39, would have a total foreign value of about \$250,000.

Duty decreased by 50 percent.—Production for the domestic market might amount to 7 million pounds, and be valued at about \$875,000. Imports might amount to 3 million pounds, supplying 30 percent of estimated consumption, with a foreign value of about \$300,000.

Duty increased by 50 percent.—Production for the domestic market might be 8 million pounds, valued at about 1 million dollars. Imports might total 2 million pounds, supplying 20 percent of estimated consumption with a foreign value of about \$200,000.

Exports

Exports of cayenne pepper, first separately reported in 1943, were in that year 26,000 pounds, valued at \$8,000. Exports probably will continue to be unimportant in the post-war period.

Employment

Information is not available regarding the number of persons employed in the domestic production of cayenne pepper.

MUSTARD

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
781-----	Mustard seed, whole, and mustard, ground or prepared:		
	Mustard seed (whole)-----	1 3/4¢ per lb.-----	32%.
	Mustard, ground or prepared.	7 1/4¢ per lb.-----	14%.
	Average-----		23%.

NOTE.—The rates fixed in the Tariff Act of 1930 were 2 cents per pound on whole mustard seed, and 10 cents per pound on ground or prepared mustard. These rates were reduced to 1 3/4 cents and 7 1/4 cents, respectively, effective January 1, 1939, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Mustard seed:				Percent
Quantity (1,000 pounds)-----	9,507	10,832	19,830	52
Value (\$1,000)-----	\$ 475	\$ 800		
Unit value (cents per pound)-----	\$ 5.0	5.4		
Prepared mustard: ²				
Quantity (1,000 pounds)-----		1,240		
Value (\$1,000)-----	7,335	\$ 13	\$ 8,148	10
Unit value (cents per pound)-----		52.8		

¹ For domestic market only; exports not available.

² Estimated.

³ Foreign value.

⁴ Domestic production consisted principally of prepared ("wet") mustard, and imports almost entirely of mustard flour.

⁵ Landed value; foreign value was \$604,000.

Mustard, principally in the form of prepared or "wet" mustard, is one of the more important spices or condiments used in the United States. Nearly all of the wet mustard consumed in this country is made here, from both imported and domestic seed.

In the period immediately preceding World War II domestic production and imports of mustard seed were approximately equal, and, although both varied greatly from one year to another, each averaged about 11 million pounds annually; in 1939, both domestic production and imports of the seed were somewhat below the average. During the war imports of the seed have declined sharply, whereas domestic production has increased approximately four-fold. The seed was imported principally from the United Kingdom, the Netherlands, Rumania, and China; and most of it was higher in prestige, and price, than

domestic seed. The exception was the seed from China, which was very low in quality and price.

Prepared mustard was produced in the United States in 1939 to the gross value of \$7,335,000, and imported to the amount of 1,240,000 pounds, with a foreign value of \$654,000. The domestic production consisted mostly of wet mustard, and the imports almost entirely of mustard flour from the United Kingdom. English mustard flour is much higher in prestige, and price, than mustard flour produced in the United States. During the war imports of prepared mustard, like those of the seed, have almost ceased, and although statistics are not available, domestic production of prepared mustard has probably been at least 2 or 3 times as great as in the period immediately before the war.

POST-WAR SHORT TERM

Because of (a) the high level of domestic production of mustard seed and prepared mustard, and (b) the inability of domestic spice manufacturers to obtain European seed and English mustard flour during the war, it appears probable that domestic production of mustard seed and prepared mustard in the short term will be considerably higher than in 1939. Imports, however, may not be more than one-half as large as in 1939; even assuming there will be a demand for imported mustard products, exportable supplies in foreign countries probably will not be available in substantial quantities.

POST-WAR LONG TERM

Consumption, Production, and Imports

Mustard has probably been used to a considerable extent during the war as a substitute for other spices which were scarce or unavailable. A part of this substitution, particularly for spices which are higher-priced than mustard, may continue after the other spices again become available. Mustard consumption may, therefore, remain somewhat higher than before the war. Imports, however, may be less than before the war, particularly under the assumption of national income at the level of 1939. Since United States spice manufacturers have necessarily used a very much smaller proportion of imported mustard with their domestic mustard during the war, they may not consider the foreign products so essential as they formerly did.

Changes in the duty of 50 percent in either direction probably would have only a moderate effect upon the total consumption of mustard seed and prepared mustard products. Such changes might, however, have considerable effect on the quantities, and even more effect upon the kinds, imported. For example, the foreign value of the Chinese seed imported in 1939 was little above the duty of 1½ cents per pound; little or no Chinese seed might enter if the duty were increased by 50 percent.

Per capita income at 1939 level.

Consumption and domestic production would probably be higher than in 1939, and imports lower.

Duty as in 1939.—Domestic consumption of seed might be about 23 million pounds. Production of seed might be around 18 million pounds (nearly double that of 1939), which at the average unit value estimated for 1939, 5 cents per pound, would be worth \$900,000. Im-

ports probably would not exceed 5 million pounds, which at the same unit value as in 1939, would have a foreign value of \$270,000.

Domestic production of prepared mustard might amount to 10 million dollars. Imports probably would not exceed 800,000 pounds which at the same unit value as in 1939, 52.9 cents per pound, would have a foreign value of \$425,000.

Duty decreased by 50 percent.—Consumption of seed might be about 24 million pounds, 17 million (valued at \$850,000) from domestic production, and 7 million (with a foreign value of \$350,000) from imports.

Domestic production of prepared mustard might be 10 million dollars. Imports might be about 900,000 pounds, which, at the unit value of 1939, would have a foreign value of about \$475,000.

Duty increased by 50 percent.—Consumption of seed might be about 23 million pounds—domestic production might supply 19 million pounds, valued at \$950,000 and imports 4 million pounds, with a foreign value of perhaps \$240,000.

Domestic production of prepared mustard might be about 10 million dollars. Imports probably would not exceed 700,000 pounds, with a foreign value of approximately \$370,000.

Per capita income 75 percent higher than in 1939.

Consumption, production, and imports of mustard seed and prepared mustard might be expected to be higher than under the per capita income level of 1939—about 20 percent higher in the case of the seed and about 25 percent in the case of the prepared mustard.

Duty as in 1939.—Consumption of seed might be 28 million pounds, of which domestic production might supply 22 million pounds, with a value, at 6.5 cents per pound, of 1.4 million dollars; and imports, 6 million pounds with a foreign value, at 7 cents per pound, of \$420,000.

Domestic production of prepared mustard might be as high as 12.5 million dollars. Imports might amount to about 1.1 million pounds, with a foreign value, at 70 cents per pound, of \$770,000.

Duty decreased by 50 percent.—Domestic consumption of seed might amount to 29 million pounds; 20 million, valued at 1.3 million dollars, from domestic production and 9 million, with a foreign value of perhaps \$540,000, from imports.

Domestic production of prepared mustard probably would be about the same as under no duty change, about 12.5 million dollars. Imports, however, might be as high as 1.2 million pounds, with a foreign value of perhaps \$840,000.

Duty increased by 50 percent.—Consumption of seed might be 28 million pounds—23 million for domestic production and 5 million for imports. The domestic production, at 6.5 cents per pound, would be worth 1.5 million dollars; the imports, at 8 cents per pound, would have a foreign value of \$400,000.

Domestic production of prepared mustard might be worth 12.5 million dollars. Imports probably would not exceed a million pounds, with a foreign value of perhaps \$700,000.

Exports

Exports of mustard seed, or prepared mustard, if any, are not separately reported.

Employment

No data regarding employment in this industry are available.

SPICES

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
762, 764, 778, 781, and 1768.	Spices, except mustard and cay- enne (red) pepper:		
	Dutiable.....	0.164 to 6¢ per lb.; 20% or 25%.	20%.
	Other.....	Free.....	
	Average.....		4%.

NOTE.—Since 1935 the duties have been reduced 50 percent on 3 of the items included in this report: Poppy seed (trade agreement with Netherlands, effective Feb. 1, 1936), curry and curry powder (trade agreement with United Kingdom, effective Jan. 1, 1936), and dried ginger root (trade agreement with Peru, July 28, 1942).

GENERAL

Data on United States imports less reexports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	641, 349
Value (\$1,000).....	26, 278
Unit value (per pound).....	\$0. 04

¹ Foreign value.

Spices are extensively used as condiments by nearly all peoples the world over. In the United States spices, or extracts from them, are used also in manufactured products such as medicines, perfumes, dentifrices, soaps, and beverages. The United States and India are the principal spice-consuming countries, and the United States is the principal importer of spices, being almost entirely dependent upon foreign sources for its supplies of these products. Before the war the only spices in this group which were produced in this country were sage and paprika, and these were produced in only small quantities.

The principal spice-growing regions of the world are in southeastern Asia, including the Netherlands Indies, East Africa, West Africa, and the West Indies. The Netherlands Indies and India were the principal producing countries. Many other regions, however, produce and export spices.

The importation of spices in unground rather than ground form was encouraged in the Tariff Acts of 1922 and 1930, either by placing whole spices on the free list or by making them dutiable at much lower rates than ground spices. This practice has been followed largely because it is difficult to detect adulteration of ground spices. During the 5 years 1935-39, about 93 percent by weight, and about 83 percent by value of the total spices imported entered in unground form.

Before the war United States imports of spices varied considerably from one year to another. The total annual foreign value of the imports in this group ranged, during the 7 years 1935-41, from a low of 6.9 million dollars in 1937 to a high of 12.8 million dollars in 1941. The imports in 1939 were slightly higher in quantity and value than the averages for this period. During the war imports have fallen to very low levels.

POST-WAR SHORT TERM

In spite of the substantial production of certain spices during the war in the United States, stocks of spices in this country at the end of the war will be very low. Supplies in exporting countries probably will, on the other hand, be unusually large, because of lack of available markets during the war. Most of the spices are nonperishable when in whole or unground form, retaining their original pungency or flavor for a very long time. Even though some of the spice-distributing facilities in Far Eastern marketing centers may have been damaged or destroyed by military operations, this probably should not prevent exportation. It is unlikely that perennial plants or trees will have suffered material damage, other than that caused by neglect. Such damage could probably be repaired within a year or two. It appears probable, therefore, that imports for immediate consumption and for replenishment of stocks will be unusually high. Domestic production will probably supply only a negligible part of consumption.

POST-WAR LONG TERM**Consumption, Production, and Imports**

Imports of spices in general are not affected markedly by minor price changes such as might result from a 50-percent increase or decrease in the duty. Marked changes in consumer income probably would, however, affect consumption substantially. There is, in addition, probably a long-time upward trend in spice consumption per capita because of (1) increasing refinements in the cooking and serving of food, (2) the use of more manufactured preparations containing spices or spice products, and (3) a tendency toward the substitution of extracts or essences of spices for the spices themselves.

Per capita income at 1939 level.

The total consumption of imported spices would probably be about 140 million pounds. At an average unit value slightly higher than the unusually low value in 1939, the total foreign value of the imported spices consumed might thus be about 10 million dollars. Domestic production of this group of spices would probably be negligible.

Per capita income 75 percent higher than in 1939.

The consumption of imported spices in this group might be about 155 million pounds. The foreign unit value might be substantially higher than in 1939, perhaps as much as one-third higher, so that the total foreign value of the imports might be approximately 14 million dollars. Domestic production would probably be of little consequence.

Employment

In the exporting centers spices were packed for export in large bags, bundles, bales, or boxes. In the United States imported spices, when passed by the Food and Drug Administration, are cleaned, sorted, ground (if to be marketed in ground form), and repacked for retail distribution. This processing and distribution of spices in this country is an industry of considerable importance, but statistics of employment are not available.

RAW COTTON, LONG-STAPLE

Tariff paragraph: 783.

Commodity: Cotton having a staple of $1\frac{1}{8}$ inches or more in length.

Rate of duty: 7¢ per lb.

Equivalent ad valorem (1939): 48%.

NOTE.—The rate of duty was reduced to $3\frac{1}{2}$ cents per pound under the trade agreement with Peru, effective July 29, 1942. Imports of cotton having a staple of $1\frac{1}{8}$ but not more than $1\frac{1}{4}$ inches in length are restricted by an annual global quota of 45,656,420 pounds. Quotas, by country of origin, totaling this amount and covering all cotton $1\frac{1}{8}$ inches or more in staple length, were imposed beginning September 20, 1939. The restrictions of the quota were suspended from application to cotton $1\frac{1}{8}$ inches or more in staple length in December 1940. Country quotas were replaced by a global quota on July 29, 1942.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Actual consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 bales) ¹	563	60	503	65	² 592	Percent 11
Value (\$1,000).....	³ 32,000	3,239	⁴ 28,761	⁵ 4,700		
Unit value (cents per lb.).....	⁶ 11.3	10.3	⁴ 11.4	14.6		
Persons employed.....	⁶ 56,000					

¹ Domestic cotton is in running bales of approximately 500 pounds each, and foreign cotton is in equivalent 500-pound bales.

² Consumption in crop year 1939-40, calculated from production, carry-over, import, and export statistics.

³ Unit value and total value were calculated from weighted values of different qualities fitted into the value of the entire cotton crop.

⁴ Total value of production for the domestic market derived from value of production minus value of exports; unit value derived by allowing 500 pounds per bale.

⁵ Foreign value.

⁶ Estimated man-years.

Long-staple cottons are used for combed yarns which go into lawns and other fine cloths, uniform twills and other army fabrics, thread, underwear, and hosiery.

Consumption in the United States declined steadily from 1 million bales in the crop year 1934-35 to 743,000 bales in 1938-39 and 592,000 in 1939-40. The decline is attributed to improvements in spinning processes, making possible the use of shorter fibers where longer ones were previously required. Consumption in 1940-41 increased to about 700,000 bales as the result of war requirements.

In spite of the decline in consumption, production increased from an average of 760,000 bales in the 2 crop years 1934-35 and 1935-36 to 994,000 in 1938-39, and, as a result, stocks at the end of this period (810,000 bales) were in excess of 1 year's needs. Production in 1939-40 (563,000 bales) was unusually small. After the outbreak of war in Europe, because of the active demand, and the threat to communications with the principal source of imports, the cultivation of long-staple cotton in the United States was expanded. Production of high-tenacity rayon, however, later made expansion of the long-staple cotton supplies unnecessary. For this reason and because of the acute labor shortage, the production of long-staple cotton dropped to 559,000 bales in 1943-44 and 338,000 in 1944-45 (preliminary).

A very large proportion (over 95 percent) of the total production ordinarily consists of long-staple upland (1½ to 1¾ inches). This type is shorter in staple length than the principal types imported. Production of American-Egyptian (1½ to 1¾ inches) which most nearly resembles the imported long-staple cotton, is very small. It ranged between 14,000 and 29,000 bales a year in the crop years 1934-35 to 1939-40. As a war measure it was increased to 74,500 bales in 1942-43, but declined to less than 9,000 bales in 1944.

Imports of long-staple cotton declined irregularly from 95,000 bales in 1934 to 65,000 in 1939. Since September 20, 1939, the imports have been subject to an annual quota of approximately 91,000 bales. In the 5 quota years which have elapsed, the quota was filled only in 1941-42 and 1942-43.

Almost 99 percent of the imports of long-staple cotton under the Tariff Act of 1930 have been from Egypt. They have been mostly of staple lengths longer than the average of long-staple cotton produced in the United States, and have been comparable with short lengths of American-Egyptian cotton. The tire-fabric industry formerly was the principal user of imported Egyptian cotton, but in recent years, as technical improvements have reduced the need for very long cottons for that purpose, the sewing-thread industry has become the chief consumer. Imported Egyptian cotton is generally preferred to American-Egyptian by thread manufacturers, partly because the large Egyptian crop offers them a wide choice of qualities.

Except for a few bales of Sea Island cotton from the West Indies, the small imports other than from Egypt have come entirely from Peru. The Peruvian cotton imported is mainly harsh cotton for special purposes.

United States exports of long-staple cotton declined steadily from 222,000 bales in 1932 to 21,000 in 1936, but increased to 60,000 in 1939. The United Kingdom is consistently the most important foreign market.

Among the factors affecting the production of long-staple cotton before the war was the Government price-support program, which tended to maintain the price in the United States above that on world markets, and so to discourage exports and stimulate imports. With a view to offsetting the effects of this program, the payment of a subsidy on exports was inaugurated in July 1939, and except for periodical interruptions, it has continued down to the present day. An import quota, previously referred to, was adopted shortly thereafter as a corollary to this measure, and has since remained continuously in force.

POST-WAR SHORT TERM

Because of small crops in the last 2 years there are not expected to be heavy stocks of long-staple cotton at the end of the war. Despite a downward trend in demand, therefore, consumption may equal production plus imports. As the price-support program, under existing law, is to continue for 2 years after the war, prices in the United States probably will remain higher than those on the world market, and imports will probably fill the long-staple cotton quota of approximately 91,000 bales a year.

POST-WAR LONG TERM

Consumption, Production, and Imports

In the estimates which follow it has been assumed that the price-support program either will be superseded by measures (such as benefit payments) which will permit cotton prices in the United States to return to world levels, or it will be accompanied by offsetting measures similar to those adopted in the latter half of 1939, which will prevent imports from obtaining a greater share of the domestic market than they would be likely to obtain in the absence of the cotton price-support program.

Per capita income at 1939 level.

Because of further improvements in spinning, which permit the use of shorter staple lengths, and because of the development of rayon in qualities which displace long-staple cotton in certain uses, consumption would probably not return to the levels existing prior to 1939-40. It might, however, exceed the unusually small consumption (592,000 bales) in that year. A figure of about 700,000 bales a year is considered likely, the amount remaining approximately the same whether the duty is unchanged, or increased or decreased 50 percent.

Duty as in 1939.—Because of the exceptionally low levels existing in 1939, both production and imports might be greater than in that year. The increase, however, probably would be less for imports than for production, as the proportion of consumption supplied by the imported cottons before the war was declining. Imports possibly would be about 8 percent greater than in 1939, or 70,000 bales, and production for the domestic market 25 percent greater than in 1939, or 630,000 bales. Because of the very great increase (over 100 percent) which has occurred in the price of all raw cotton during the war, prices probably would be considerably greater than in 1939. An increase of about 30 percent in the average unit value of production (to 15 cents a pound) and 25 percent in the average foreign unit value of imports (to 18 cents a pound) is considered likely. The value of production for the domestic market then would be about 47.2 million dollars and the foreign value of imports about 6.3 million dollars.

Duty reduced by 50 percent.—Although imports probably would increase somewhat, any great increase is unlikely, because of the limited (and declining) market for the staple lengths usually imported. Imports might be about 90,000 bales a year (the amount of the quota) or 30 percent greater than if the duty were unchanged. The foreign unit value (say 17.4 cents a pound) probably would be slightly less than estimated on the basis of unchanged duties, as the imports probably would not be restricted to the same extent to high-priced cottons. The total foreign value of imports then would be about 7.8 million dollars a year. Production for the domestic market might be 610,000 bales, or about 3 percent less than if the duty were unchanged. The unit value (say 14½ cents a pound) might be slightly less than estimated on the basis of unchanged duties, and the total value of production for the domestic market be 44.2 million dollars a year.

Duty increased by 50 percent.—Imports might be about 40,000 bales, or 35 to 40 percent less than with no change in duties. They probably would be further restricted to the high-priced cottons, with the result

that the foreign unit value (about 18.6 cents a pound) would be greater than estimated on the basis of unchanged duties. They might then have a total foreign value of about 3.7 million dollars a year. Production for the domestic market possibly would be increased above that estimated with duties as in 1939 by approximately the amount of the decrease in imports, or 30,000 bales. It would then be about 660,000 bales which, at an average value of 15½ cents a pound (or slightly greater than estimated with unchanged duties), would have a total value of about 51.2 million dollars a year.

Per capita income 75 percent higher than in 1939.

Because of increased activity in the manufacture of yarns and fabrics in which long-staple cotton is used, consumption might be about 875,000 bales a year, or 25 percent greater than estimated with per capita income the same as in 1939. Imports, which consist of the more-expensive qualities, might exceed those estimated at the lower level of income by from 25 to 40 percent, depending on the rate of duty. The average value of both production and imports possibly would be 10 to 15 percent greater, under each of the three rates of duty, than was estimated with per capita income the same as in 1939. Upon the basis of the foregoing considerations, the following estimates are derived in the same manner as those given under the assumption of a lower level of income.

Duty as in 1939.—Imports might be 90,000 bales, with a foreign value of 9.2 million dollars and production for the domestic market 785,000 bales, valued at 66.5 million dollars a year.

Duty reduced by 50 percent.—Imports (assuming that the present quota limitation of 90,000 bales is removed or fixed at a higher figure) might be 115,000 bales, with a foreign value of 11.3 million dollars and production for the domestic market 760,000 bales, valued at 62.2 million dollars a year.

Duty increased by 50 percent.—Imports might be 55,000 bales, with a foreign value of 5.8 million dollars and production for the domestic market 820,000 bales, valued at 71.8 million dollars a year.

Exports

Exports of long-staple cotton formerly were several times as great, but in the 5 years ending in 1939 they averaged only about 5 percent of production, or 48,000 bales, valued at 2.9 million dollars a year. Although the amount later was increased somewhat, partly as the result of the payment of export subsidies, it probably will not be maintained after the war at a point much, if any, in excess of the 1939 level.

Employment

Employment in the production of long-staple cotton in 1939 (56,000 man-years) is estimated upon the assumption of 300 man-hours to a bale and 3,000 hours (300 10-hour days) per man per year. Because of greater use of labor-saving machinery, production per worker probably will be increased considerably after the war, and employment reduced. Employment may be only from 65 to 80 percent of that in 1939, or 35,000 to 45,000 man-years.

BANANAS

Tariff paragraph: 1618,
 Commodity: Bananas (green or ripe).
 Rate of duty: Free.

GENERAL

Data on United States imports less reexports (apparent consumption) for 1939 are given below:

Quantity (1,000 bunches).....	56, 410
Value (\$1,000).....	¹ 27, 806
Unit value (per bunch) ²	\$0. 49

¹ Foreign value.

² Average weight per bunch equals 50 pounds.

Bananas are imported free of duty, principally from the Central American and other Caribbean countries. Two companies control the major part of production and four-fifths of the transportation and distribution of bananas reaching the United States market. Because of the close control exercised by these companies and the wide geographic distribution of banana plantations, production has been kept in balance with demand and prices relatively stable. This has been done despite the prevalence of destructive tropical storms in the banana-producing region, the perishable nature of the fruit, and the susceptibility of the trees to disease. From 1900 until the present war the long-term trend of per capita consumption in the United States has been upward, although in the short term, demand has been influenced by changes in consumer income, and by changes in the price differential between bananas and citrus fruit. Imports averaged 47 million bunches annually during the 5-year period 1921-25, and rose to 59 million bunches annually in the 5-year period 1936-40. Owing to the scarcity of shipping space since 1941, imports of bananas have fallen to less than half the 1936-40 average. Production has been cut accordingly, but because of the rapid growth of new trees, the former level of production could be attained within 2 years.

POST-WAR SHORT TERM

It seems probable that in the post-war short term consumption of bananas will increase over 1939, owing to the assumed higher national income and the increase in population. Total consumption may reach 62-70 million bunches. Increased competition with domestic citrus fruits may cause banana prices to fall somewhat below the 1943 level of 62 cents per bunch. At 57 cents a bunch, imports of 62-70 million bunches will have a foreign value of 35-40 million dollars.

POST-WAR LONG TERM

For the long-term period it is assumed that the shifting of banana production to virgin areas, which has been initiated during the present war, will be continued, and, coupled with more effective control of diseases, will result in a larger production at lower costs. Moreover, increased efficiency in distribution (improved ripening techniques) will probably make bananas available to a larger part of the population, particularly in small towns.

Per capita income and prices same as in 1939.

The probabilities are that consumption will be about the same in quantity and value as in the post-war short term, the effect of the further increase in population being offset by the decline in national income to the 1939 level.

Per capita income 75 percent higher than in 1939.

The large national income, together with prices which will probably be only moderately above those in 1939, may be expected to give rise to a considerable increase in per capita consumption of bananas and cause total consumption in the United States to rise, approximately 25-40 percent above 1939, or to about 70 to 80 million bunches. Assuming a price about 10 percent higher than in 1939, these imports would have a foreign value of 40-45 million dollars.

HARD, CRISP RYE BREAD, YEAST-LEAVENED

Tariff paragraph: 1623.

Commodity: Hard, crisp rye bread, yeast-leavened.

Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds)-----	2, 176
Value (\$1,000)-----	¹ 226
Unit value (cents per pound)-----	10. 4

¹ Foreign value.

Hard, crisp rye bread, yeast-leavened, commonly called Swedish rye bread, is a hard, crackerlike type and is not competitive with the ordinary baker's type of rye bread. Imports, however, do compete, to a certain extent, with similar domestic production such as rye crisp and health bread. United States production of these products is not known.

Imports of hard, crisp rye bread varied only moderately with decreases or increases in the national income but have increased in recent years. Consumption and imports in 1939 may be considered as normal. Even though domestic production of similar products should increase, imports would probably not be affected.

Between 90 and 95 percent of imports come from Sweden and the remainder mainly from Norway, Finland, and Denmark.

POST-WAR SHORT TERM

Consumption and imports might be about 5 percent higher than in 1939.

POST-WAR LONG TERM

Per capita income at 1939 level.

Although domestic production of similar products under special names and advertised as health foods may increase, the per capita consumption of imports of the hard, crisp rye would probably remain about the same as in 1939. Imports and consumption would probably amount to about 2.4 million pounds with, at 1939 prices, a foreign value of about \$250,000.

Per capita income 75 percent higher than in 1939.

Because of the so-called health feature of this type of bread, imports and consumption might increase considerably, to about 25 percent over the 1939 level, and amount to about 2.7 million pounds, with a foreign value, at 12 cents a pound, of about \$324,000.

CITRON

Tariff paragraph: 1649.
Commodity: Citron in brine.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	U. S. production		Imports	Appar-ent con-sump-tion	Ratio of imports to con-sump-tion
	Total	For domestic market ¹			
Quantity (1,000 pounds).....	1,000	1,000	2,586	4,265	Percent
Value (\$1,000).....	62	62	² 162		61
Unit value (cents per pound).....	3.7	3.7	4.0		
Persons employed.....	(³)				

- ¹ Exports were negligible.
² Foreign value.
³ See under "Employment."

Citron, as soon as harvested, is cut in halves, the pulp is scooped out, and the thick rind which remains is stored in brine solely for the manufacture of candied citron. Consumption of the crude or raw citron in brine is, therefore, determined by the demand for candied citron.

In the pre-war period, 1936-40, United States consumption of candied citron averaged approximately 4.5 million pounds annually, of which 0.5 million pounds were imported as candied citron, dutiable at 6 cents per pound. Total consumption of the candied citron, converted to terms of raw citron at the ratio of 100 to 110, was the equivalent of about 5 million pounds of raw citron, or 0.038 pound per capita. Per capita consumption has been but little affected by the level of consumer income, but has declined during the war because imports were cut off and domestic production has not increased rapidly enough to replace them.

However, domestic production of citron in brine has been increasing for some time, especially during the war. Domestic production is largely confined to California and Puerto Rico. In the 1930's production in California advanced from almost nothing to an average of about 150,000 pounds annually; and in Puerto Rico it increased from 0.5 million pounds in 1931 to 1.5 million in 1939, and to 3.4 million pounds in 1943. Production in California is increasing slowly, but production in Puerto Rico may eventually be large enough to supply the entire United States demand.

In the period immediately following the First World War, when there was as yet no production of raw citron in the United States, imports of raw and candied citron were of about equal importance,

averaging 1.8 million pounds each; in the 1926-30 period, imports of raw citron were down to 1.2 million pounds and those of candied up to 3 million pounds. When, in the Tariff Act of 1930, the duty on candied citron was raised from 4½ cents per pound to 6 cents, and the 2-cent duty on the raw citron was removed, the trend in imports of both kinds was reversed. By 1940, imports of the raw citron in brine had increased to 3.2 million pounds, and those of the candied had declined to 300,000 pounds. Before the war about 90 percent of the imports of citron in brine came from Italy and 10 percent from Greece.

F. o. b. prices of Puerto Rican raw citron before the war were 8.7 cents per pound; they rose to 13 cents in 1941 and declined to 10.7 cents in 1943; prices of the imported citron (foreign value 4 cents in 1939) averaged 5 cents per pound during the depression period 1931-35 and 5.3 cents in 1936-40. It is probable that citron can be produced as cheaply in Puerto Rico as in Italy. However, costs in California are probably considerably higher than in Italy.

POST-WAR SHORT TERM

By the end of the war, domestic production of citron in brine will hardly have increased sufficiently to supply the entire domestic demand on the basis of the pre-war per capita consumption of 0.038 pound. The difference may be supplied by imports, which will probably be much less than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Assuming that per capita consumption of raw citron will be about as in 1939, namely 0.038 pound, total consumption, with a 10-percent increase in population, would amount to approximately 5.5 million pounds. Possibly all of this could then be supplied by Puerto Rico and California, although production in California may not exceed 200,000 pounds. But some of the trade might still prefer to import candied citron directly from Italy, and some manufacturers might prefer the foreign raw material. The ratio of domestic production to imports is difficult to forecast, but if 200,000 pounds of candied citron and possibly one million pounds in brine were imported, then approximately 4.3 million pounds of citron in brine, or about 80 percent of domestic consumption, would be supplied from domestic sources. At 4 cents per pound, domestic production would have a value of approximately \$175,000. Imports of 1 million pounds of citron in brine, at 5 cents per pound, would have a foreign value of \$50,000.

Per capita income 75 percent higher than in 1939.

On the basis of its reaction to changes in the level of consumer income before the war, an annual per capita consumption of 0.04 pound of citron in brine may be assumed at the higher level of income. With a population of 144 million, 5.8 million pounds would be needed to satisfy the requirements for the manufacture of candied citron.

At the higher prices under this income level, imports of both raw and candied citron would probably be greater in quantity, possibly by 10 percent, or 1.1 million pounds of the raw citron in brine, and by 25

percent, or 250,000 pounds of the candied citron. Demand for the domestic raw citron would then be about 4.45 million pounds, which at 5.5 cents per pound would have a value of approximately \$245,000. Imports of 1.1 million pounds of citron in brine at 6.5 cents per pound would have a foreign value of approximately \$70,000.

Exports

Exports of citron, if any, in the past have been unimportant. At the recent rate of increase of production in Puerto Rico, there may be a surplus for export in the future.

Employment

Just before the war, the bearing acreage of citron in Puerto Rico was estimated at about 375 acres, and that in California at 35 acres, a total of 410 acres. At 100 man-hours per acre annually, this acreage required about 41,000 man-hours, or the equivalent of 17 persons fully employed during the year. In the post-war period the labor requirements for the acreage then in bearing may be as much as 30 man-years or 30 persons employed for a full year.

COCOA BEANS

Tariff paragraph: 1653.
Commodity: Cocoa Beans.
Rate of duty: Free.

GENERAL

Data on United States imports less reexports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds)-----	641, 349
Value (\$1,000)-----	126, 278
Unit value (per pound)-----	\$0. 04

¹ Foreign value.

Cocoa beans are not produced in the United States. They are the raw material from which are manufactured cocoa, chocolate, and cocoa butter. (See separate section on cocoa, chocolate, and cocoa butter.)

The United States is the world's largest importer of cocoa beans. The principal sources of United States imports are West Africa (the Gold Coast, Nigeria, and French West Africa), Brazil, and the Caribbean countries. Imports increased steadily from an annual average of 435 million pounds during 1926-29 to 572 million pounds during 1936-39, representing a per capita increase of about 2 percent per annum. Imports in 1939, however, were at least 5 percent above the average.

The average foreign unit value of United States imports in 1939 of 4.2 cents per pound was only slightly above the low average value of the depression years of 1932 and 1933 and 20 percent less than the average for years of 1935 to 1939. The world production and reported world stocks of cocoa beans in 1939 were the largest on record, which partly accounted for the low price in that year.

POST-WAR SHORT TERM

In the first few years after the war it is believed that United States imports of cocoa beans may be from 20 to 30 percent higher than in 1939. It is taken for granted that the pre-war upward trend of domestic consumption will be maintained and that coupled with the assumed higher level of national income, United States consumption and prices of cocoa beans should be appreciably higher than in 1939.

POST-WAR LONG TERM

Imports

Per capita income at 1939 level.

It is estimated that the consumption per capita of cocoa beans might be possibly 10 percent over the pre-war average, and, assuming an increase in population of 10 percent, the probable total domestic consumption at this income level would be about 20 percent greater than the average of pre-war years, or about 15 percent greater than in 1939 and amount to approximately 740 million pounds, with a total foreign value of possibly 35 million dollars assuming that unit values will be at least 20 percent higher than the relatively low values of 1939.

Per capita income 75 percent higher than in 1939.

United States consumption of cocoa beans per capita may increase possibly 30 percent over the pre-war average and the price increase as much as 50 percent over the relatively low unit values in effect in 1939. On this basis the total consumption to be supplied by net imports would be in the neighborhood of 875 million pounds, with a total foreign value of about 55 million dollars.

Exports

Since cocoa beans are entered free of duty, United States exports consist of reshipments of the imported article. The quantity reshipped or exported annually varies considerably but seldom has exceeded 5 percent of the total imports.

COFFEE

Tariff paragraph: 1654.
Commodity: Coffee, raw or green.
Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (million pounds)	2, 014
Value (\$1,000)	¹ 139, 542
Unit value (per pound)	\$0. 069

¹ Foreign value.

Coffee is not produced in the continental United States. Before the present war, 98 percent of United States coffee imports were supplied by countries of the Western Hemisphere, Brazil supplying 57 percent, Colombia 23 percent, El Salvador, Guatemala, and Mexico together, 10 percent, and others, 8 percent.

Imports over the long term are equal to consumption, but imports from year to year tend to reflect expectations of importers as to fluctuations in prices more than changes in consumer demand. The trend in per capita consumption in the United States has long been upward. In general, per capita consumption has responded to low prices for coffee as well as to higher consumer income; it went up somewhat during the depression years of the early 1930's, when prices and consumer incomes were low and increased rapidly during the late 1930's, when coffee prices continued to decline and consumer incomes were rising. From 11.7 pounds annually during the years 1921-25, per capita consumption increased to 12.2 pounds during 1926-29; to 12.6 pounds during 1930-34; and to 15.3 pounds during 1938-40. In the war years 1941-43, during which consumer income increased steadily, and, despite rationing of coffee from December 1942 through July 1943, per capita consumption averaged 15.4 pounds even though the price had nearly doubled since 1940.

Owing to the pressure of surplus production in Brazil and other Latin-American countries and, after September 1939, to the cutting off of the European market, the import price (foreign value) declined from 22.3 cents per pound in 1935 to a low of 6.2 cents in 1940. For more than 40 years coffee-producing countries had been faced with the problem of adjusting production to demand in an effort to stabilize prices, and various attempts by Brazil acting unilaterally to control the supply met with only limited success. Because of this situation and the emergency conditions created by the war, the Inter-American Coffee Agreement of November 28, 1940, was concluded between the United States and the Latin-American coffee-producing countries. Under this agreement the United States market is allocated among the 14 American producing countries by assigning a quota to each country. Although there is no provision in the agreement for direct price control, the Inter-American Coffee Board exercised its authority to regulate the quotas so as to check the decline in prices. As a result of the activities of the Board and war developments, the import price rose to an average of 12.4 cents in 1943, at which level it has since been held by United States Government control under the Office of Price Administration. With the European markets again open and United States consumption of coffee continuing its upward trend, demand for coffee after the war is likely to increase. In addition to these demand and supply factors, prices will largely depend on whether regulatory controls are maintained and to what extent. For the following estimates it is assumed that the Inter-American Coffee Agreement or similar controls will remain in force.

POST-WAR SHORT TERM

In the immediate post-war period, the upward trend in per capita consumption of coffee will probably continue at approximately its pre-war rate. With per capita consumption estimated at 15.5 pounds, and a population estimated at 140 million, total annual United States consumption would be 2.0-2.2 billion pounds. At a price of 12 to 15 cents per pound (from about the same to 25 percent higher than in 1943) total annual imports would have a foreign value of 240-330 million dollars, or 70-140 percent greater than in 1939.

POST-WAR LONG TERM

After the war a number of changes in the demand for and supply of coffee may be expected. New areas of production in Africa as well as areas of secondary importance in Latin America were assuming increased importance before the war and will probably continue to increase their output in the future.

Per capita income at 1939 level.

Per capita consumption of coffee in the United States is likely to increase after the war at about the same rate as in pre-war years, and may amount to about 16 pounds per capita by 1953. This being the case, total imports would approximate 2,300 million pounds. Assuming a price higher than in 1939 by 20-40 percent, that is, a price of 8-10 cents per pound, imports would be valued at 180-230 million dollars.

Per capita income 75 percent higher than in 1939.

Under this assumption, per capita consumption, by 1953, might average about 17 pounds, indicating imports of about 2,500 million pounds—approximately a 25 percent increase over 1939. Assuming a price of 10-12 cents per pound—somewhat higher than under a lower national income—imports would be valued at 250-300 million dollars, or 80-120 percent above 1939.

RAW COTTON, SHORT-STAPLE

Tariff paragraph: 1662.

Commodity: Cotton having a staple less than 1½ inches in length.

Rate of duty: Duty-free.

NOTE.—Effective Sept. 20, 1939, imports of cotton less than 1¼ inches in staple length (other than harsh or rough cotton less than ¾ inch in staple length and chiefly used in the manufacture of blankets and blanketing, and other than linters) have been restricted by Presidential proclamation, under section 23 of the Agricultural Adjustment Act of 1939, as amended, to annual quotas, by countries of origin, totaling 14,516,532 pounds.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Actual consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 bales) ¹	10,918	4,400	6,419	77	7,191	Percent 1.1
Value (\$1,000).....	\$ 805,000	225,983	579,017	2,821		
Unit value (cents per pound).....	9.00	9.94	8.88	7.30		
Persons employed (number).....	800,000					

¹ Domestic cotton is in running bales of approximately 500 pounds each, and foreign cotton is in equivalent 500-pound bales.

² Actual consumption in the crop year August 1, 1939, to July 31, 1940. Data are not available for calculating consumption of short-staple cotton separately from long-staple cotton on a calendar-year basis. Stocks were drawn upon.

³ Unit value and total value were calculated from weighted values of different qualities, fitted into the farm value of the entire cotton crop.

⁴ Total value of production for domestic market derived from value of production minus value of exports; unit value derived by allowing 500 pounds per bale.

⁵ Foreign value.

⁶ Estimated man-years.

Short-staple cotton constitutes about 90 percent of the consumption and 95 percent of the production of raw cotton in the United States.¹

Until the outbreak of war in Europe, the United States remained the largest world exporter of raw cotton. The imports into this country were very small in comparison with the exports, and consisted for the most part of cotton of types either not produced here, or produced in amounts insufficient for local requirements.

World consumption of all raw cotton increased from an annual average of 25.2 million bales in the 5 years 1925-29 to 28.5 million bales in the years 1935-39, but over the same period the portion supplied by the United States declined, from an average of 14.7 million bales (or 58 percent of the total) to 12.1 million bales (or 42 percent of the total). The decline occurred in the foreign rather than in the domestic market for American cotton. It resulted in part from the increasing development of textile industries in countries (principally the Soviet Union and China) which were not important users of American cotton; in part it was probably the result of a series of price-support programs in the United States, beginning in 1929, which may have accelerated the expansion of cotton growing in foreign countries, particularly Brazil.

Approximately 15 percent of the foreign cotton production is long-staple and 50 to 60 percent is cotton comparable in staple length with American short-staple cotton; the remainder is very short staple and is substituted for American cotton only at a considerable price differential.

The total consumption of cotton in the United States has increased gradually, but has fluctuated with changes in business activity and in consumer income. It declined from 6.7 million bales in the 5 years 1925-29 to 4.9 million bales in the crop year 1931-32, but increased to 8 million bales (which was greater than in any previous year) in 1936-37. As the result of war requirements, consumption rose to 11.2 million bales in 1941-42, but was down to 9.9 million bales in 1943-44 because of labor shortage and deterioration of equipment in the cotton manufacturing industry.

Of the total consumption of cotton in the United States nearly 40 percent enters into apparel uses, nearly 40 percent into industrial uses, and over 20 percent into household uses. The principal industrial uses are in automobiles and bags, which together accounted for 16 percent of total cotton consumption in 1939.

Although the consumption of rayon had been increasing rapidly before 1939, it was still equal to less than 15 percent of the quantity of cotton consumed in that year. During the war, however, the rate of expansion of rayon consumption has far exceeded that of cotton. It has been especially pronounced in the case of high-tenacity rayon, which is suitable for many uses (such as tire fabrics) in which cotton was formerly required. Very great expansion also has occurred in the consumption of rayon-staple fiber, which is competitive with cotton in price and which can be spun and woven on cotton-manufacturing machinery. Cotton also confronts increased competition from paper (especially in bags), plastics, and glass fiber.

Short-staple cotton produced for the domestic market (i. e., actual consumption of American short-staple cotton in this country) averaged

¹ Short-staple cotton in this statement refers to cotton less than 1 $\frac{1}{4}$ inches in staple length.

5 million bales in the 5 crop years 1929-30 to 1933-34 and 5.5 million bales in the 5 crop years 1934-35 to 1938-39. The range during the decade was from 4.3 million bales in 1934-35 to 7.0 million bales in 1936-37. Requirements for the defense program, together with increased civilian consumption because of a high level of employment, brought the quantity consumed up to 7.1 million bales in 1939-40. In the war years 1941-42 and 1942-43, it exceeded 10 million bales.

Imports of short-staple cotton declined from 108,400 bales in 1930 to 48,500 bales in 1932, but increased to 163,300 bales in 1937. In the 5 years 1935-39 they averaged 105,000 bales, about 75 percent of which came from India, China, and the Netherlands Indies and 20 percent from Mexico. The Far Eastern cotton imported is harsh and very short. Twisted around a core yarn of American cotton, it is used in blankets to give a desirable nap. Cotton of this type is not produced in the United States.

Exports of short-staple cotton in 1930 and 1931 averaged 6.5 million bales a year, and during the next 2 years (partly as the result of unusually small Indian crops) they averaged 8.4 million bales, but thereafter they declined irregularly to 5.7 million bales in 1937 and 4.3 million in 1938.

To prevent a further loss of foreign markets, the Government of the United States inaugurated an export subsidy for raw cotton in July 1939, and this has been continued with periodical interruptions up to the present time. As the subsidy operated to maintain the price of American cotton abroad at a level below that in the United States, it necessitated measures to prevent excessive imports of raw cotton into this country. It was therefore accompanied in September 1939 by import quotas on raw cotton, which are still in force. The annual quota on short-staple cotton is approximately 29,000 bales. The quotas, however, except imports of harsh or rough cotton less than $\frac{1}{4}$ inch in staple length customarily imported for special purposes. This type of cotton is unsuitable for the general uses of cotton in the United States.

POST-WAR SHORT TERM

The combination of reduced stocks of textiles and a high level of purchasing power is expected to create strong demand for cotton manufactures. The limiting factor in cotton consumption will probably be mill capacity as textile machinery has been deteriorating during war years. Replacement of machinery will be made as rapidly as possible and cotton consumption will probably be at a high level. Imports of the types of short-staple cotton subject to the quota will, presumably, be limited to the present annual quota of about 29,000 bales. Imports of quota-free cotton might increase over pre-war levels, but this type has relatively restricted use in the United States. Government loans on cotton and controls of acreage will probably be in effect, as it appears that, at the end of the war, there will be on hand a quantity of cotton equivalent to consumption in a pre-war year, in addition to the then current crops.

POST-WAR LONG TERM

Consumption, Production, and Imports

The United States probably will continue as the world's largest producer of cotton. The total crop is expected to supply an adequate quantity for the domestic market, and imports in the future as in the past probably will consist chiefly of cottons produced in this country on a limited scale, or not at all, and restricted in their use to special purposes. Imports presumably will remain at about the same level whether or not there is a Government program of assistance to the cotton grower. Without price support American cotton will sell at a world price and there will be no incentive to import cotton in large quantities; with a price-support program, it is probable that quotas or other Government controls will be applied to keep imports within their accustomed limits.

The estimates which follow are based on those made elsewhere for cotton yarn (see statement on par. 901) with a small allowance for consumption in other textile and nontextile industries.

Per capita income at 1939 level.

Per capita consumption of cotton probably would not be as great as in the immediate pre-war years because new articles would compete for the consumers' income and cotton would share the smaller expenditure for textiles with newer fibers, consumption of which is expected to expand. Decline in per capita consumption, however, might be more than offset by the increase in population and the total consumption of short-staple cotton might be about 6.6 million bales (5 percent above the average for the 4 crop years 1936-37 to 1939-40). Of the total quantity, imports might supply slightly less than 2 percent, or in the neighborhood of 120,000 bales. This amount is about one-seventh greater than the average annual amount in the years 1935-39. It presumes imports of cotton now covered by the quota at about the quota level, and imports of short, harsh cotton at a level slightly above the average in recent pre-war years, because of an increase in the production of cotton blankets. Production for the domestic market then would supply upwards of 98 percent of the total consumption, and be about 6½ million bales.

As the result of the very great increase (120 percent) in the price of raw cotton in the United States between 1939 and 1944, the average value of both production and imports probably would be greater than in 1939. The actual price which would obtain is highly conjectural, as it would depend on both economic and political factors. An average unit value of production about 33 percent greater than in 1939, or approximately 12 cents a pound, would not be unlikely. On this basis, the estimated total value of production for the domestic market would be 390 million dollars a year. The price of imported cotton possibly would not undergo as great an increase as that of cotton produced in the United States. The foreign unit value of imports might be 25 percent greater than in 1939, or about 9 cents a pound, in which case the estimated total foreign value of imports would be 5.4 million dollars a year.

Per capita income 75 percent higher than in 1939.

Consumption of short-staple cotton might be 25 percent greater than was estimated with per capita income the same as in 1939, and

be about $8\frac{1}{2}$ million bales, or approximately the pre-war peak, despite the increase in the consumption of synthetic fibers. Imports might constitute about the same proportion of consumption as at the lower level of income. In this event the estimated quantity of imports would be 150,000 bales, and the remainder of consumption, amounting to 8.1 million bales, would be supplied by production for the domestic market.

Because of generally higher prices, the average foreign value of imports might be 10 cents a pound (instead of 9 cents as at the lower level of income) and the average value of production 13 cents (instead of 12 cents). The estimated total foreign value of imports then would be $7\frac{1}{2}$ million dollars and the estimated value of production for the domestic market 525 million dollars.

Exports

Exports depend upon so many variables, both those that devolve upon economic conditions and those that result from governmental controls (in foreign countries as well as in the United States) that it is impossible to forecast the quantity with any degree of accuracy. An international agreement on cotton export trade is pending. The share of United States cotton in world export markets would be decided by this agreement, but the basis for decision, if it has been settled, has not been made public. In the absence of an agreement, the United States Government might either continue to subsidize exports, or permit the price of cotton in the United States to decline to the world level, and substitute other forms of aid to farmers (such as direct payments) for the existing price-support program. Possibly exports, without subsidy, could be maintained, despite competition from other fibers and from foreign-grown cotton, at between 2 million and 3 million bales a year, depending upon the level of prosperity and business activity in foreign countries. If this were to occur, the total quantity of production of short-staple cotton might be $8\frac{1}{2}$ -11 million bales, and the total value 510-715 million dollars.

Employment

Employment is estimated on the basis of man-hours required to produce a bale. On the assumption that a total of 220 man-hours entered into the production of one bale of short-staple cotton and that there are 3,000 hours in a work-year, the number of man-years is calculated at about 800,000 for the crop of 1939. Man-hours required per bale of cotton vary considerably with the quality of cotton produced and with the region of production. Moreover, there has been a downward trend in man-hours per bale since the beginning of the century, and this doubtless will be accelerated by further improvement in farm techniques and more complete mechanization of cotton production. The average number of man-hours required to produce a bale may be reduced as much as 20 percent below that in 1939, to 175. On the basis of the estimates of production already given, employment would then be 500,000 to 650,000 man-years, or from about 60 to 80 percent of requirements for the short-staple cotton crop in 1939.

COTTON LINTERS

Tariff paragraph: 1662.
Commodity: Cotton linters.
Rate of duty: Duty-free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Actual consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	661	158	503	33	568	Percent 5.8
Value (million dollars).....	\$ 14	4	10	0.77		
Unit value (cents per pound).....	\$ 2.15	2.37	2.00	2.36		
Persons employed.....	(⁹)					

¹ Pounds (net weight) calculated, on basis of 507 pounds per bale, from production recorded in bales.

² Actual consumption, calculated in pounds (net weight) from recorded bales.

³ Average unit value and total value calculated from average price for each grade, weighted by quantity of each grade produced.

⁴ Foreign value.

⁵ Production of cotton linters in the United States is a byproduct of the cottonseed-oil industry and no data on employment are available.

Cotton linters, the fuzz or short fibers (including small amounts of long fibers) left on cottonseed after ginning, are removed by a subsequent mechanical process similar to ginning. In the United States, linters are graded by fiber length. The longest can be spun, the medium lengths are used for mattress and upholstery stuffing, and the shortest are consumed chiefly in "chemical cotton pulp." Chemical cotton pulp is an important source of cellulose for the manufacture of rayon, celluloid and other plastics, lacquer, photographic film, and smokeless powder. All grades of linters can be used for chemical cotton pulp, but the shortest grades are better for this purpose, and they are cheaper.

In the 5 years 1931-35, United States consumption of cotton linters averaged 428 million pounds and, in the 4 years 1936-39, 489 million pounds. It is estimated that of the 568 million pounds consumed in 1939, about 200 million pounds were used in chemical cotton pulp and most of the remainder in mattresses and automobile and furniture upholstery stuffing.

In the United States, linters are a byproduct of the cottonseed-oil industry. The quantity of linters, therefore, depends on the size of the cotton crop, on the proportion of seed crushed, and on the "cut" of linters per ton of seed. Production in the 5 years 1931-35 averaged 481 million pounds; and in the 4 years 1936-39, 697 million pounds.¹

In the 4-year period 1936-39, imports averaged 21 million pounds, ranging from 14 million to 33 million pounds. In those years the annual imports from the Soviet Union averaged 8.7 million pounds; from Brazil, 6 million; and from Mexico, 5.6 million.

POST-WAR SHORT TERM

As the price-support program for cotton, by act of Congress, will continue for 2 years after the war, the production of cotton will probably continue at the level it has more or less maintained for the past 7

¹ This period was selected because imports were not recorded separately from short-staple cotton before 1936; they are, however, known to have been small.

years (crops of 1938 to 1944). Production of linters would then be about the same as in 1939. Consumption would probably increase; but it is doubtful whether it would utilize the entire domestic production. It is also doubtful whether export markets will be available immediately after the war. Imports would probably be but a very small part of total consumption.

POST-WAR LONG TERM

Consumption, Production, and Imports

It seems probable that there will be a considerable expansion in the use of chemical cotton pulp over pre-war consumption, especially for high-tenacity rayon, although this use will be affected by the relative price of dissolving grades of wood pulp, and there may be some increase in the use of upholstery linters. As linters are a byproduct of the cotton crop, production can be only moderately affected by the demand for linters. Imports are expected to supply the difference between production and consumption. Extension of cotton growing in foreign countries, as well as an increased interest in recovery of linters in those already producing cotton, will probably greatly increase world production of linters in the post-war long term. Prices, though considerably higher than in 1939, would be expected to bear a lower ratio to the price of cotton.

Per capita income at 1939 level.

Consumption might be about 750 million pounds, an increase of about 50 percent over the average for 1936-39. Of this quantity, imports might supply about 30 percent, or about 225 million pounds. Imports would probably have a foreign value of approximately 8 million dollars. Production, which would be limited by the cotton crop, would probably be about 525 million pounds, or about 80 percent of that in 1939, and would probably be valued at about 18 million dollars.

Per capita income 75 percent higher than in 1939.

With increased use of plastics and of rayon, consumption might be more than 60 percent higher than in 1939, or about 930 million pounds. Consumption would then be approximately 25 percent more than at the low income level. Imports might supply about 30 percent, or approximately 270 million pounds, the estimated foreign value of which would be about 11 million dollars. Production, dependent upon the cotton crop, would probably be approximately 660 million pounds, or the equivalent of that in 1939. The total value of domestic production would then amount to about 26 million dollars. All the output would be required for the domestic market.

Exports

The United States has been on a net export basis for cotton linters, except during World Wars I and II. In the 4 years 1936-39, exports averaged 162 million pounds. Germany was by far the most important market, but other countries increased their takings in the years just before war began in Europe in 1939.

It is not anticipated that domestic production in the post-war long term will be sufficiently large to supply the domestic requirements; and the exports, if any, therefore, will be small, although they were important in the pre-war years.

Employment

As employment in the production of cotton linters is a part of the employment in the cottonseed-oil industry, no data are available on which to base estimates of employment in the long term. Changes in employment, however, would be related to the total quantity of seed crushed. In the post-war long-term period the number of persons engaged in the production of cotton linters would, at the 1939 level of income, possibly be about 15 percent smaller than in 1939. At the higher income level probably about the same number would be employed as in 1939.

COTTON WASTE

Tariff paragraph: 1662.

Commodity: Cotton mill waste, not advanced in value by any processing except willowing (a simple cleaning process).

Rate of duty: Duty-free.

NOTE.—Effective September 20, 1939, imports of cotton card strips, comb waste, lap waste, silver waste, and roving waste are restricted by annual quotas allocated by country of origin. Two-thirds of the quotas from specified European countries were reserved for card strips and comb waste made from cottons 1½ inches or longer. Effective March 31, 1942, the quotas were suspended from application to card strips made from cottons having a staple 1½ inches or more in length. The country quotas total 5,452,500 pounds.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	1 423	80	1 343	17	360	Percent 4.7
Value (million dollars).....	1 25	5	1 20	0.77		
Unit value (cents per pound).....	16	6.22	16	4.55		
Persons employed.....	(¹)					

¹ Estimated.

² Foreign value.

³ As cotton waste is a byproduct of cotton-textile manufacturing, no persons are employed in its production. Cotton waste processed for various uses is not covered in this discussion. Imports of processed waste are negligible and are very small.

Cotton mill waste produced before any twist has been inserted—that is, before spinning—is known as soft waste; that containing twist is known as hard waste. An estimated 70 percent of the mill waste can be made into yarn; the remainder is used chiefly in mattresses and for automobile and furniture upholstery filling, except the hard waste (also called yarn or thread waste), which is sold as wiping waste for machinery.

Production of cotton waste is not determined by demand, but fluctuates with the mill consumption of cotton. There is no fixed ratio of waste production to cotton consumption. In general calculations, the percentage of waste made is frequently taken as averaging about 11 to 12 percent of the net weight of the cotton used.

Consumption of waste for the years 1936-39 is estimated to have averaged about 370 million pounds.

Because of demands for different types of waste in different parts of the world, many cotton-manufacturing countries, including the United States, both import and export waste. United States imports of cotton waste fluctuate widely. In the 4 years 1936-39 they averaged 50 million pounds, valued at 2.4 million dollars (4.80 cents per pound); but ranged from 11.4 million pounds, valued at 0.6 million dollars, in 1938, to 99 million pounds, valued at 4.6 million dollars, in 1936 (the maximum recorded). Imports in 1939 were about one-third the average quantity imported in the 4 years 1936-39. Non-spinnable wastes, principally from the Far East, constituted 92 percent of the average in the years 1936-39, and card strips, almost entirely from the United Kingdom and Canada, constituted 6.5 percent. Imports of card strips (from about 3 to 3.5 million pounds yearly) fluctuate less than imports of other wastes.

Production in 1936-39 is estimated to have averaged about 400 million pounds.

The United States exports chiefly comber waste, card strips, and, in smaller quantities, hard waste.¹ Germany, with a well-developed cotton-waste spinning industry, was the principal destination of United States exports before the war. Exports averaged 77.6 million pounds, valued at 5.5 million dollars (7.14 cents per pound), in the 4 years 1936-39. Exports in 1939 exceeded this average quantity by about 3 percent.

POST-WAR SHORT TERM

Consumption of cotton is expected to be at a relatively high level, limited mainly by available machinery which has depreciated from continuous activity during the war. Production of cotton waste would, therefore, also be high. Domestic demand for automobile, upholstery, and mattress filling is likely to be above the pre-war level. The high price of cotton, owing to the cotton price-support program, will probably cause strong demand for spinnable waste.

POST-WAR LONG TERM

Consumption, Production, and Imports

The following estimates of production are based on the expected consumption of cotton. It is assumed that, if Government price support should create a demand for spinnable waste, import quotas thereon would be retained. Without such stimulation of demand, spinnable waste would probably constitute a small part of total imports. Imports, under either condition, would probably approximate the following estimates. Any change that might result from a general change in duties would be slight. The United States is likely to have a surplus of spinnable waste and a deficiency in the supply of wastes for the automobile, upholstery, and mattress industries. Extension of cotton manufacturing in new foreign areas may mean that larger quantities of the nonspinnable wastes will be produced in countries where there is no demand for such wastes. Prices, therefore, might not be much above the level of prices in 1939.

¹ Export statistics indicate that soft wastes other than card strips or comber waste have been important; one of the largest exporters, however, stated that the bulk of the exports so recorded has been in reality card strips or comber waste.

Per capita income at 1939 level.

Consumption might be approximately 10 percent above the estimated average consumption in 1936-39, or about 400 million pounds. Of this quantity imports might supply about 12½ percent, or about 50 million pounds, to be used chiefly for upholstery purposes. At a foreign unit value of 4.55 cents per pound (as in 1939), the total foreign value of imports would be about 2.3 million dollars. Total production, determined by mill consumption of cotton, is expected to be about 420 million pounds, of which about 350 million pounds would be for the domestic market. The remainder would be types produced in excess of requirements. At 6 cents per pound (as estimated for 1939), the value of production for the domestic market would be about 21 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of cotton waste might be 25 percent higher than at the lower income level, or approximately 500 million pounds. Imports, mainly supplying the deficiency of wastes used for stuffing, would probably bear about the same ratio to consumption as at the lower income level. They might be about 90 million pounds, with an average foreign unit value of about 4.9 cents per pound, or a total foreign value of about 4.4 million dollars. Total production, limited by mill consumption of cotton, is expected to be about 490 million pounds, of which 410 million pounds would probably be of types required by the domestic market. At a price probably only slightly above that at the low income level, the value of production for the domestic market would probably be about 26.6 million dollars.

Exports

Exports would probably consist chiefly of spinnable types of waste produced in excess of domestic demand. At the low-income level, they might be about 70 million pounds, with a value of about 4.4 million dollars; and, at the high-income level, produced in larger quantities because of increased cotton consumption, they might be 80 million pounds, valued at about 5.4 million dollars.

SAUSAGE CASINGS

Tariff paragraph: 1755.

Commodity: Sheep, lamb, goat, cattle, and hog casings.

Rate of duty: Free.

GENERAL

Data on United States production, exports, imports, and apparent consumption in 1939 are shown below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	(1)	16,800	(1)	16,456	(1)	Percent
Value (\$1,000).....	17,403	4,965	12,438	* 6,993	19,431	
Unit value (per pound).....	(1)	\$0.20	(1)	\$0.42	(1)	

1 Not available.

* Foreign value.

Sausage casings are a byproduct of the United States slaughter industry. Their most important use is in the manufacture of frankfurter sausages. Owing to a rapidly increasing use of domestically produced synthetic casings in the past 15 years, a much larger proportion of the intestines than formerly goes now into tannage. This is particularly true of sheep and lamb casings, which have met with keen competition from synthetic, largely cellophane, casings. Of the imports, about 40 percent in volume and 90 percent in value are accounted for by sheep, lamb, and goat casings of the sizes most used in this country.

POST-WAR SHORT TERM

Consumption, production, and imports of sausage casings will probably follow the general trend of meat consumption.

POST-WAR LONG TERM

Consumption, Production, and Imports

The assumed changes in the duties on livestock and meats will probably affect domestic production of casings in proportion to their effect on domestic production of live animals, but will affect consumption of casings very little, if at all.

Per capita income at 1939 level.

Consumption may have a value of 20.5-21.5 million dollars. Production for the domestic market may have a value, at 1939 prices, of 13.5-14.0 million dollars. Imports might have a foreign value of 7.0-7.5 million dollars and thus supply about one-third of consumption.

Per capita income 75 percent higher than in 1939.

Consumption may have a value of 27-29 million dollars. Production for the domestic market may have a value, at prices 20-25 percent above 1939, of 18-19 million dollars. Imports may have a foreign value of about 9-10 million dollars and may supply about one-third of consumption.

Exports

Exports consist of sizes the production of which exceed United States requirements. About 80 percent of the exports have been beef and hog casings. In the past, exports have been about equal to imports in volume but considerably lower in value because about 40 percent of the imports consisted of high-priced sheep, lamb, and goat casings. In the post-war long term exports will probably be 5.5-6.5 million dollars and amount to 25-30 percent of United States production.

Employment

No data are available.

SUGAR-BEET SEED

Tariff paragraph: 1757.
Commodity: Sugar-beet seed.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Consumption ²	Ratio of imports to consumption
	Total	For domestic market ¹			
Quantity (1,000 pounds).....	13,563	13,563	8,243	15,000	Percent 55
Value (\$1,000).....	1,246	1,246	792		
Unit value (per pound).....	\$0.10	\$0.10	\$0.096		

¹ Exports were negligible.

² Estimated quantity of seed used in 1939 for production of sugar beets and sugar-beet seed.

³ Estimated.

⁴ Foreign value.

During recent pre-war years the normal annual requirements of the United States for sugar-beet seed were at least 15 million pounds. In the 1920's and until about 1935 practically all the sugar-beet seed utilized was imported. Germany was the most important source of supply, accounting for some 75 to 85 percent of the total used. Denmark, the Netherlands, Czechoslovakia, and Poland supplied most of the remainder. Beginning in the early 1930's production in the United States became increasingly important. By 1939 domestic production was almost sufficient to satisfy the total domestic demand, and in 1941 it exceeded it.

Under any circumstances now foreseeable, it is improbable that any considerable quantities of sugar-beet seed will be imported after the war. Domestic production is likely to satisfy all requirements. Strains especially adapted to different areas in the United States have been developed. Domestic seed can be produced at prices approximating the pre-war prices of European seed.

POST-WAR SHORT TERM

During the years immediately after the war, production of sugar-beet seed will probably be much greater than during 1939. Domestically grown seed will probably supply all domestic demand, as well as substantial quantities for export.

POST-WAR LONG TERM

Consumption, Production, and Imports

The production of sugar-beet seed in the long-term period will, of course, depend on the requirements of domestic sugar-beet growers and possible export demand. At 1939 per capita income levels, production of seed will probably be about 18 million pounds and have a farm value of 1.8 million dollars. At per capita income levels 75 percent higher than in 1939, production is likely to be in the neigh-

borhood of 20 million pounds, and, at a unit value perhaps 50 percent greater than in 1939, its total value would be 3 million dollars. Imports, if any, will probably be small.

Exports

Exports of sugar-beet seed were not separately classified before January 1, 1945. Small quantities are known to have been exported during recent years. Probably substantial quantities of sugar-beet seed will be sent to European countries during the immediate post-war years, to aid in the rehabilitation of the industry. Exports in the long-term period will probably be small.

Employment

No data relating to employment in the production of sugar-beet seed are available.

TEA

Tariff paragraph: 1783 (b).
Commodity: Tea, n. s. p. 1.
Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	97,791
Value (\$1,000).....	21,090
Unit value (per pound).....	\$0.216

¹ Foreign value.

Tea is not produced in the United States. As reexports are insignificant, imports over a group of years represent domestic consumption. Imports in any particular year, however, are affected by the speculative views of dealers as to future prices and vary more than consumption. In 1939, when imports were 97.8 million pounds, actual consumption was about 93 million pounds. Estimates of future imports must necessarily be based on the ratio of future consumption to actual consumption in 1939 rather than to imports in that year.

United States consumption has been, and probably will be, little affected by changes in consumer incomes. There has been a gradual decline in per capita consumption, which has just about offset the increase in population. The decline in per capita consumption was the result of the shift from green to black tea, as more cups are brewed from a pound of black tea than from a pound of green; there appears to have been practically no change in per capita consumption of the beverage as such. Before the present war, imports consisted of about 80 percent black and 20 percent green teas, and actual consumption averaged 0.70 pound per capita per year. In 1943, when only black tea was used (green tea, the product of China and Japan being unavailable because of war conditions), consumption averaged 0.64 pound.

POST-WAR SHORT TERM

In the immediate post-war period the principal unforeseeable question affecting tea imports is how soon, and to what extent, the trade in green tea can be revived. If it is not resumed at all during

that period, consumption, being restricted to black tea, may probably be, as in 1943, about 0.64 pound per capita. In that case total consumption, with a population of about 140 million (regardless of national income) may probably be in the neighborhood of 89-91 million pounds, compared with consumption in 1939 of 93 million pounds, and actual imports of 97.8 million. Should the price of tea during this period remain at the high level of 1943 (32.3 cents), as may well happen, considering that the tea industry of the Netherlands Indies, which before the war supplied 17 percent of total world trade, may not have recovered sufficiently to be back in the market on a large scale, the annual (foreign) value of imports may be 28-30 million dollars.

If the trade in green tea is resumed, with no post-war effect on the producing areas, the per capita consumption may be somewhat greater than without green tea, but would nevertheless be somewhat smaller than before the war because of the long-time trend to replace green tea by black, and because that trend will presumably be accentuated by the interruption of green-tea drinking during the war. Assuming that green tea would constitute only 10 percent of the total consumption, per capita consumption of all teas would probably be about 0.67 pound, and (in view of the increase in population) total consumption would be approximately 93-96 million pounds, with a foreign value of 30-31 million dollars.

POST-WAR LONG TERM

Per capita income at 1939 level.

It may be assumed that trade with China and Japan (green tea) and with the Netherlands Indies (black tea) will have revived fully, and that ample supplies of both kinds will be available. It seems likely, however, that consumption of green tea will not exceed 10 percent of the total. In that case, per capita consumption of all tea would be about midway between the pre-war and the war average, or, about 0.67 pound. With the increased population the consumption, and consequently the imports, may be estimated at 96-99 million pounds, the increase in population over 1939 somewhat more than offsetting the smaller per capita consumption. Assuming the unit prices of 1939 to apply, the imports will be valued at 21-22 million dollars.

Per capita income 75 percent higher than in 1939.

The quantity of consumption would probably be no greater than above estimated but prices might be 10-15 percent above 1939 prices, and the imports might be valued at 23-25 million dollars (foreign value).

SCHEDULE 8. SPIRITS, WINES, AND OTHER BEVERAGES

INTRODUCTION AND SUMMARY

This section covers, either separately or as groups, all important articles listed under schedule 8; those of which the imports in 1939 amounted to \$100,000 or more. No beverages are provided for on the free list. The number of dutiable articles covered is 9. In 1939 imports of these articles were valued at 58.8 million dollars; total imports under this schedule amounted to 59.1 million dollars.

Certain peculiarities relating to the commodities falling under schedule 8 have an important bearing on the estimates of production and imports:

(1) Most alcoholic beverages (beer is the most important exception) require aging for a considerable period to make them suitable for consumption. The quantities actually manufactured in a given year may bear little relation to the quantities withdrawn from warehouse for consumption after aging. The data given for domestic production in 1939 in the several reports relate, except for beer, to the quantities of tax-paid withdrawals for consumption, and the estimates of post-war production are on the same basis.

(2) Imported beverages in general have a prestige which enables them to sell (after payment of duty and tax) at a considerably higher price than the nearest equivalent domestic product. In general, the foreign unit values for imports (i. e. ex-duty and ex-tax) are higher than the estimated unit values (ex-tax) for the corresponding domestic product.

(3) Imported alcoholic beverages, except beer, are subject not only to duty but also to the same rate of internal revenue tax as domestic beverages. The situation with respect to beer is set forth in the subsection dealing with that commodity.

(4) The internal revenue tax is a large factor in the price of alcoholic beverages, and consumption is to some extent affected by the price. During the war the taxes have been increased greatly. Present laws, however, provide for somewhat lower rates when the war is over. Estimates of future consumption (and consequently of production and imports) have necessarily to be based on the assumption that the taxes so prescribed will in fact be in effect in the post-war period.

It is difficult to estimate the value of the domestic output of alcoholic beverages in the post-war period, by reason of the inadequacy of the statistics of values in 1939. The 1939 quantities shown for all alcoholic beverages, except beer, in the several subsections which follow are those of withdrawals for consumption as reported by the United States Bureau of Internal Revenue. These data are given in terms of quantity only, without values. The United States Bureau of the Cen-

sus reports values of the several classes of alcoholic beverages produced, but the unit values in general do not include the value added by aging and only part, if any, of the value of containers. The United States Tariff Commission has consequently made, on the basis of a variety of sources of information, rough estimates of the appropriate unit values of the several classes of beverages, in bottles, except that the values for beer are based partly on beer in barrels or kegs and partly on bottled beer. To arrive at the values of production in 1939, these estimated unit values have been multiplied by the quantities as reported for that year. In estimating the value of the domestic output of the same beverages in the long-term post-war period, on the assumption of no change in national income, the estimated quantities of production have been multiplied by the estimated unit values of 1939; at the higher income level the unit values have been increased by 15 percent.

The margin of error in the estimates of unit values made by the Commission may be so large that it has not seemed appropriate to present the results of these calculations for the individual classes of beverages. The Commission arrives at the conclusion that the value of the domestic output of all alcoholic beverages in 1939, on a basis fairly comparable with the foreign value of imports, was somewhere between 900 million and 1,050 million dollars. The figure for 1939 actually reached by the methods of computation described was 968 million dollars. Beer represented about 63 percent of this total and whisky about 27 percent.

Estimates of post-war production (for domestic market) and imports of the nine reported articles have been totaled. (Where estimates are not given in a single figure but in the form of a probable range, the middle point of the range has been taken for purposes of tabulation.) The following tabulation compares these total estimates with actual production (for the domestic market) and actual imports in 1939:

Period, income level, and tariff treatment	Production for domestic market		Imports	
	Value	Ratio to 1939	Foreign value	Ratio to 1939
	Million dollars 1939	Percent 100	Million dollars 68.8	Percent 100
<i>Spirits, wines, and other beverages, dutiable</i>				
1939				
Post-war long term:				
Per capita national income as in 1939:				
Duty as in 1939	1,122	116	67.2	114
Duty reduced 50 percent	1,115	115	82.8	143
Duty increased 50 percent	1,126	116	56.9	97
Per capita income 75 percent higher than in 1939:				
Duty as in 1939	1,762	182	126.8	220
Duty reduced 50 percent	1,751	181	155.0	264
Duty increased 50 percent	1,770	183	109.9	157

¹ Estimated from quantities reported in official statistics and unit values estimated by the United States Tariff Commission.

For reasons already indicated, the combined totals of estimated post-war production (for the domestic market) for schedule 8, under the several assumptions regarding income and duties, are subject to a somewhat greater margin of error than similar combined totals for articles in many of the other tariff schedules. The margin of error is presumably narrowed somewhat by the offsetting of errors in

opposite directions in the estimates for the individual articles. The effect of this offsetting of errors, however, is lessened by the fact that the total number of items included is small, and the fact that in the domestic production two articles, beer and whisky, account for over 90 percent of the total value, and in imports whisky alone accounts for much the greater part of the total.

It will be seen that the estimates for the post-war period, on the assumption that both national income and rates of duty are the same as in 1939, show, both for production and for imports, totals which exceed the 1939 figures by somewhat more than 10 percent, the assumed percentage of increase in population. The consumption of alcoholic beverages is considerably affected by changes in national income. The estimates, under the assumption of income 75 percent higher than in 1939, exceed those based on the assumption of an unchanged income by approximately 60 percent for production and 95 percent for imports, but part of this difference is due to the assumed advance of 15 percent in prices. Since imported beverages are mostly high-priced products, the effect of high income upon imports would probably be somewhat greater than that upon production.

According to these estimates, a reduction or an increase of 50 percent in the rates of duty would result in considerable changes in the value of imports; but, since imports constitute only a relatively small fraction of consumption, the corresponding percentage changes in domestic production would not be marked.

GIN

Tariff paragraph: 802.
 Commodity: Gin.
 Rate of duty: \$2.50 per proof gal.; Equivalent ad valorem (1939): 91%.
 \$2.00 per proof gal. from Cuba.

NOTE.—The rate fixed in the Tariff Act of 1930 was \$5 per proof gallon, which was reduced to \$2.50 per proof gallon, effective February 1, 1936, pursuant to the trade agreement with the Netherlands. By reason of the 20 percent preferential granted to Cuban products, the 1930 rate on Cuban gin (34) was reduced to \$2.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export			
Quantity (1,000 proof gallons).....	13,197	0	72	13,269	Percent 0.5
Value (\$1,000).....	(5)	0	195	(5)	
Unit value (per proof gallon).....			\$2.70		

¹ Tax-paid withdrawals plus production at rectifying plants, fiscal year 1939-40.

² Not available.

³ Foreign value.

Gin, generally the lowest priced of the distilled alcoholic beverages, though much less important in the United States than whisky, has been used to a considerable extent by the less well-to-do as a straight liquor and by the more well-to-do as an ingredient of mixed drinks. Before the present war nearly all of the gin consumed in the United

States was produced domestically; probably nowhere else can ordinary gin be produced more cheaply. The small quantities imported (0.5 percent of apparent consumption in 1939) consisted principally of London dry gin, a high-priced product from the United Kingdom. In 1939 the average foreign value per gallon of imports, \$2.70, was unusually low; in most years it had been about \$3 per gallon. Comparable figures for domestic gin are not available, but it is known that the value per gallon of the domestic product (in bottles) before payment of tax was much less than that of imports.

Between repeal of the prohibition amendment and the outbreak of the present war the domestic production of gin was 12-15 million gallons annually, imports were small, and exports negligible. During the war, consumption has fallen to about 60 percent of normal; domestic production has dropped very low, imports have increased enormously, and exports have ceased. The increase in imports has consisted mostly of low-priced goods from Cuba and Mexico, much of which did not meet the specifications for gin as outlined by the United States Bureau of Internal Revenue in Regulation No. 5, "Labeling and Advertising of Distilled Spirits," and consequently was required by the Office of Price Administration to be retailed as "distilled spirits (produced in, or imported from, Cuba or Mexico) made from cane products and flavored with aromatics."

The internal revenue tax on distilled beverages, domestic and imported, was increased from \$6 to \$9 per proof gallon, effective April 1, 1944. Under the terms of the present law the rate is to return to \$6 six months after the end of the war, and it is assumed that this is the rate which will be in effect in both the short and the long term. In 1939 the tax was only \$2.25 per proof gallon. Making allowance for the fact that gin is usually marketed at less than 100 proof, the \$6 rate is equivalent to about \$1.02 per fifth, whereas the \$2.25 rate was equivalent to only about 38 cents per fifth. The higher price after the war, resulting from the higher tax, would tend to lower consumption at that time compared with that in 1939.

POST-WAR SHORT TERM

It is impossible to estimate the consumption of gin during the immediate post-war period with any degree of certainty. The expected relative shortage of other distilled liquors at the end of the war may tend to cause a shift to gin. Presumably domestic supplies will be ample, for, unlike whisky, gin does not require aging. Thus consumption might be greater than in 1939. On the other hand, the poor quality of most of the imported brands brought in during the war to eke out the domestic shortage may have somewhat discouraged the demand for gin. Consumption will be supplied almost entirely by domestic gin, although imports, which probably will again consist chiefly of high-priced products from the United Kingdom, probably will at least equal, or will even exceed, imports in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Although the increase in population would tend to increase the consumption of distilled liquors above the 1939 level, this influence may be offset by the higher prices to consumers in consequence of the

anticipated higher internal revenue tax. The uniformly higher tax will diminish the pre-war differences among the retail prices of distilled liquors, and may be expected to curtail the purchase of the cheaper kinds such as gin, particularly domestic gin, somewhat more than that of others. Imports of gin, which would be mostly of brands carrying special prestige, would be relatively less affected by the higher internal revenue tax. It is, therefore, probable that the total domestic consumption of gin, with per capita income at about the 1939 level, will not be much above and might be somewhat below the 1939 rate. Consumption may thus range from about 12 million to 14 million proof gallons. Imports would probably account for $\frac{1}{4}$ to $1\frac{1}{4}$ percent of domestic consumption under any of the duty levels contemplated.

Duty at 1939 level.—Imports might amount to 80,000–100,000 proof gallons, with a foreign value (at the 1939 unit value) of 215,000–270,000 dollars.

Duty reduced by 50 percent.—Such a decrease in duty might be expected to result in imports of 125,000–150,000 proof gallons with a foreign value of perhaps 335,000–400,000 dollars.

Duty increased by 50 percent.—Under such circumstances imports might amount to 50,000–70,000 proof gallons with a foreign value of 135,000–190,000 dollars.

Per capita income 75 percent higher than in 1939.

It seems fairly certain that total consumption of distilled liquors would increase in consequence of a higher per capita income, but it is not certain that the consumption of gin would rise. Consumption might range anywhere from 13 million gallons, the 1939 figure, to as much as 40 percent higher, or 18 million proof gallons. Imports, being of a higher price than the domestic product, but nevertheless subject to the same internal revenue tax, probably would increase at this level of income.

Duty as in 1939.—Imports might be in the range of 100,000–150,000 gallons. Prices of imported gin would probably be somewhat higher than in the pre-war period, perhaps 10 to 15 percent. The imports thus might have a foreign value of 300,000–465,000 dollars.

Duty reduced by 50 percent.—Imports under these circumstances might be 150,000–200,000 proof gallons with a foreign value of 450,000–625,000 dollars.

Duty increased by 50 percent.—Imports under these circumstances might be in the range of 75,000–100,000 gallons with a foreign value of 225,000–310,000 dollars.

Exports

Exports will probably continue to be negligible, as they were previous to the present war.

Employment

In the United States gin is produced mostly by large-scale production methods, with a relatively small number of workers. Changes in the volume of gin produced would cause less change than proportional in the number of persons employed.

BRANDY

Tariff paragraph: 802.

Commodity: Brandy.

Rate of duty: \$2.50 per proof gal.

Equivalent ad valorem (1939): 56%.

NOTE.—This subsection refers only to brandy used for beverage directly (i. e., not including brandy or fruit spirits for fortifying wine). The rate fixed in the Tariff Act of 1930 was \$5 per proof gallon, which was reduced to \$2.50 per proof gallon, effective June 15, 1936, pursuant to the trade agreement with France.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export			
Quantity (1,000 proof gallons).....	1,690		770	2,460	Percent 31.3
Value (\$1,000).....			\$3,439		
Unit value (per proof gallon).....	(9)		\$4.47		

¹ Tax-paid withdrawals, fiscal year ending June 30, 1939.

² Foreign value.

³ Not available.

Brandy is distilled from grape or other wine, and when the term is used without a modifier it means grape brandy. In the United States about 90 percent of all brandy is made from grape products, including raisins, and most of the brandy-distilling industry is operated as an adjunct of the wine industry. The general term "brandy" is applied also to the high-proof grape spirits used principally for fortifying wines. In this report, however, only beverage or commercial brandy, i. e., that used directly as beverage, is included, since imports are of this class. In the pre-war period only about 15 percent of the total quantity of all brandy (including grape spirits) distilled was for beverage use.

Beverage brandy (hereafter called brandy) is one of the higher priced of the common distilled beverages. Before the war the consumption of brandy in the United States compared with that of some other distilled liquors was low; in 1939 it was 2.5 million proof gallons. Production (tax-paid withdrawals) ranged between 1.5 million and 2 million proof gallons annually. Imports averaged about 750,000 proof gallons, or approximately 30 percent, on the basis of quantity, of the total United States consumption; in terms of value the proportion represented by imports was considerably greater, because the unit value of the imports is much higher than that of domestic brandy. Nearly all of the imports came from France, and consisted of cognac and other high-priced brandy.

During the war, brandy consumption has increased to between 3 and 4 times the 1939 level. United States production increased almost threefold, or to about 5 million proof gallons in the fiscal years 1942-43 and 1943-44. Imports dropped off sharply in 1941 and 1942, but increased to unprecedented levels in 1943 and 1944, especially in the latter year. The increased production and imports resulted from the limited supply of other alcoholic beverages, especially whisky, in this country. During the war Portugal and Spain have been the principal sources of imports. Not only the quality of imported brandy, but

even the prices (ex duty and tax) have been lower than before the war.

For some years the most important influence determining the price of distilled beverages has been the internal revenue tax. This tax has been changed frequently. In 1939 it was \$2 per proof gallon; at the present time (1945) it is \$9 per proof gallon; 6 months after the end of the war it is to return, according to the present law, to \$6 per proof gallon, and it is assumed in this report that this rate will be in effect in the post-war periods for which estimates are given below. The \$6 rate amounts to approximately \$1 per fifth (at about 85-proof as brandy is ordinarily bottled), compared with only about 34 cents per fifth for the \$2 rate in 1939.

POST-WAR SHORT TERM

The demand for brandy probably will be greater than in 1939. As stated, brandy consumption has gone up more than threefold during the war. Moreover, although there will no longer be a general shortage of alcoholic beverages, the supply of aged whisky will be short. It appears probable, therefore, that total consumption and domestic production of brandy will be at least double, and imports approximately triple, what they were in 1939. It is uncertain how much high-grade old brandy can be obtained from the cognac area of France, which was occupied by the Germans. A large part of the imports may continue to be, as now, ordinary grades from Portugal and Spain.

POST-WAR LONG TERM

Consumption, Production, and Imports

In view of the great increase during the war, the production, imports, and consumption of brandy will probably remain above the 1939 level, even though the national income should return to approximately the 1939 level. However, imports will probably again come to consist primarily of high-priced brandies such as cognac; consequently changes in the duty probably would not affect domestic production appreciably, although they would probably affect the volume of imports moderately. The fact that the revenue tax (assumed to be \$6 per gallon) greatly exceeds the assumed change in the duty, minimizes the effect of such duty change.

Per capita income at 1939 level.

Duty as in 1939.—Total consumption might be 3.0–4.5 million proof gallons, of which domestic production might supply 2–3 million and imports 1.0–1.5 million gallons. At the 1939 price level the imports might thus have a foreign value of 4.5–6.7 million dollars.

Duty reduced by 50 percent.—Domestic production probably would not be materially different from the 2–3 million proof gallons previously assumed. Imports (and consumption) might be greater by as much as 300,000 gallons under such a duty than they would be under the 1939 rate, consumption becoming 3.3–4.8 million gallons, and imports 1.3–1.8 million gallons, with a foreign value, at the same price level as in 1939, of 5.8–8.0 million dollars.

Duty increased by 50 percent.—Such an increase in duty, though it would probably leave domestic production relatively unchanged, might cause imports to be smaller than they would be with the duty

unchanged, by approximately 200,000 proof gallons. Consumption thus might be roughly 2.8-4.3 million gallons and imports from 0.8-1.3 million gallons, the latter with a foreign value, at the 1939 unit price, of probably 3.6-5.8 million dollars.

Per capita income 75 percent higher than in 1939.

Brandy being somewhat of a luxury item, consumption would probably be substantially greater at this level of income than at the lower level previously assumed.

Duty as in 1939.—Total consumption might be in the range of 5-7 million proof gallons, of which 3-4 million might be supplied by domestic production and 2-3 million by imports. The latter, at unit prices 10 to 15 percent higher than in 1939, might thus have a foreign value of 9.8-15.4 million dollars.

Duty decreased by 50 percent.—Domestic production might be expected to be about the same, 3-4 million proof gallons, but imports (and consumption) might be greater by approximately half a million proof gallons, making consumption 5.5-7.5 million gallons and imports 2.5-3.5 million gallons, the latter (at unit prices 10 to 15 percent higher than in 1939) having a foreign value of 12.5-18 million dollars.

Duty increased by 50 percent.—Production probably would be about the same, or 3-4 million proof gallons. Imports might be lower than at the 1939 duty level by approximately 300,000 proof gallons, making the consumption 4.7-6.7 million proof gallons and imports 1.7-2.7 million, with a foreign value (at unit prices 10 to 15 percent higher than in 1939) of 8.5-14.0 million dollars.

Exports

Exports of brandy are not separately reported, and are believed to be negligible, if any at all.

Employment

Information regarding employment in this industry is not available.

RUM

Tariff paragraphs: 802.

Commodity: Rum.

Rate of duty: Rum in containers of 1 gal. or less, \$2.50 per proof gal. (\$2 per gal. on product of Cuba); rum in barrels or casks, \$5 per proof gal. (\$4 per proof gal. on product of Cuba). *Equivalent ad valorem (1939): 48%.*

NOTE.—The rate fixed by the Tariff Act of 1930 was \$5 per proof gallon (\$4 if product of Cuba). Cuban rum, in bottles holding 1 gallon or less, was reduced to \$2.50 per proof gallon, effective September 3, 1934, pursuant to the Cuban trade agreement. The general rate on rum in containers holding 1 gallon or less was reduced to \$2.50 per proof gallon, effective June 3, 1935, pursuant to the trade agreement with Haiti, which resulted in a preferential rate on Cuban rum in such containers, of \$2 per proof gallon. Since January 30, 1943, the general rate on rum in containers of more than 1 gallon has also been \$2.50 per proof gallon (\$2 if Cuban) pursuant to the trade agreement with Mexico.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 proof gallons).....	4,531	39	4,503	394	5,196	Percent 7.6
Value (\$1,000).....	(*)	43	(*)	1,810		
Unit value (per proof gallon).....		\$1.48		\$4.58		

* Fiscal year ended June 30, 1939; includes production in Puerto Rico and estimated production in the Virgin Islands.

† Not available.

‡ Foreign value.

Rum is distilled from sugarcane products, principally blackstrap molasses or cane juice. The quality and price of rum vary considerably among different brands, depending upon the raw material used, the methods of production (particularly the care exercised in manufacturing and blending), the alcoholic content, and the length of time the product is aged.

During the war, when the supply of all alcoholic beverages was limited and the demand was unusually great, consumption of rum increased nearly threefold (from 5 million to about 15 million gallons). Much of the increase represented the substitution of rum for gin and whisky. The United States output, including that of Puerto Rico and the Virgin Islands, increased from an average of somewhat less than 5 million proof gallons during the 5 years 1933-40 to approximately 11 million proof gallons in 1942. Before the war about half of the domestic output was produced in the continental United States. Most of the increase during the war took place in Puerto Rico; production in the continental United States has remained relatively stable (at between 2 million and 3 million proof gallons) since repeal. Imports increased from about 400,000 proof gallons annually before the war to more than 5 million in 1943. The imports formerly consisted of high-priced rum in bottles, principally from Cuba and Jamaica, but during the war they have consisted chiefly of low-priced barreled rum (principally from Cuba and the French West Indies), the duty on which was reduced from \$5 to \$2.50 per proof gallon in the Mexican trade agreement, effective January 30, 1943.

The internal revenue tax on rum, domestic and imported, was increased from \$6 to \$9 per proof gallon, effective April 1, 1944. Under the terms of the present law the \$6 rate is to be reestablished 6 months after the end of the war. It is assumed in this report, therefore, that the \$6 rate will be in effect in both the short- and the long-term periods. In 1939 the tax was only \$2.25 per proof gallon, or approximately 38 cents per fifth at the proof customarily bottled, whereas the \$6 rate would represent about \$1 per fifth. The same rates apply to other liquors of high alcoholic content.

In the following estimates for the post-war periods, it is assumed that Puerto Rico will retain its present political status. However, the subject of Puerto Rican independence has been under official discussion for some time, and a bill to that end is now before Congress (S. 227, 79th Cong.). Should Puerto Rico become politically independent, the estimates for domestic production and imports would need to be altered substantially, as in the estimates given it is assumed that Puerto Rico would supply the larger part of domestic production. At present Puerto Rican rum may be sold in the United States without the payment of any duty. Moreover, the internal revenue tax collected on this rum is turned over to the Puerto Rican Government. Should Puerto Rico become independent, its sales to the United States would be classed as imports and would be subject to duty, unless some special arrangement to the contrary were adopted.

POST-WAR SHORT TERM

In view of the prospective short supply of aged whisky for several years after the war, it appears probable that the total consumption of rum will be considerably greater than it was in 1939, and that both domestic production, particularly that in Puerto Rico, and imports will be considerably above their pre-war levels.

POST-WAR LONG TERM

Consumption, Production, and Imports

In the long term rum will no longer be in special demand as a substitute for other distilled beverages, as adequate supplies of the others will be available. It is probable, however, that the greatly increased consumption of rum during the war will affect the drinking habits of some consumers and that rum will remain permanently in greater demand than before the war.

Before the reduction of the duty on barreled rum on January 30, 1943, from \$5 to \$2.50 per proof gallon, practically all of the rum imported entered in bottles, as on rum entering in such containers the duty had already been reduced to \$2.50. In 1943 and 1944 the imports of barreled rum were three to four times as great as those of bottled rum, and the foreign unit value of the rum imported in barrels was only about \$1 to \$1.50 per proof gallon, compared with \$4 to \$4.50 per proof gallon for that imported in bottles. Part of this difference was due, of course, to the cost of bottling, but, in addition, bottled rum is generally of higher quality. Consequently the unit values of imports later referred to are based upon assumed duties twice as high on barreled rum as on bottled rum, since that relationship existed in 1939. On this assumption it is likely that most of the rum which would be imported under any duty level would be bottled before entry through the customs.

Per capita income at 1939 level.

Total consumption (taking account also of population growth), might be 20 to 50 percent greater than in 1939, or perhaps 6-8 million proof gallons. Assuming continued free entry from Puerto Rico, it appears probable that the greater part of this would be supplied from that source. The imports, which may be expected to consist principally, as before the war, of comparatively high-priced

bottled rum, probably would not be greatly affected by 50 percent changes in the duty, and such changes in imports as did occur probably would have a reciprocal effect upon domestic production, that is, if imports were higher domestic production would be lower by an approximately equal amount, and vice versa, thus leaving total consumption probably about the same.

Duty as in 1939.—Consumption might be 6-8 million proof gallons, domestic production 5.5-7.2 million, and imports 0.6-0.8 million, with a foreign value, at unit values as in 1939, of 1.9-3.0 million dollars.

Duty reduced by 50 percent.—Under this assumption imports might be higher by perhaps 200,000 proof gallons, making the total imports 0.7-1.0 million, with a foreign value of 2.7-3.5 million dollars. Domestic production might be correspondingly less, or 5.3-7.0 million proof gallons.

Duty increased by 50 percent.—Imports might be less than under the 1939 duty level by 100,000 proof gallons, making the total imports perhaps 0.4-0.7 million proof gallons, with a foreign value of 1.5-2.7 million dollars. Domestic production probably would be higher by a corresponding amount.

Per capita income 75 percent higher than in 1939.

Total consumption under this assumed income might be as much as 50 percent higher than with no change in income, in which case it would amount to 9-12 million proof gallons.

Duty as in 1939.—Consumption might be 9-12 million proof gallons, domestic production 8.0-10.5 million, and imports 1.0-1.5 million gallons; the high income would affect imports more than production, because they are high-priced brands. At unit values 10 to 15 percent higher than in 1939, the imports would thus have a foreign value of 4.2-6.6 million dollars.

Duty reduced by 50 percent.—Under this assumption imports might be higher by perhaps 300,000 proof gallons, making the total imports 1.3-1.8 million gallons, with a foreign value of 5.5-8.0 million dollars. Domestic production might be less by about the same amount, making the total about 7.7-10.2 million proof gallons.

Duty increased by 50 percent.—Imports might be less than under the 1939 duty level by about 200,000 proof gallons, making the total imports from about 0.8-1.3 million gallons, with a foreign value of 3.4-5.7 dollars. Domestic production would probably be greater by about the same amount as the reduction in imports, making the total about 8.2-10.7 million proof gallons.

Exports

The exports of 29,000 proof gallons in 1939 were considerably greater than before or since that year. Exports will probably continue to be small.

Employment

No information is available regarding the number of persons employed in the rum industry, either in the continental United States or in Puerto Rico or the Virgin Islands. Changes in the volume of production or imports probably would result in much less than proportional changes in personnel.

WHISKY

Tariff paragraph: 802.

Commodity: Whisky.

Rate of duty: Aged 4 years or more, *Equivalent ad valorem (1939):* 50%.
\$2.50 per proof gal.;
under 4 years old,
\$5 per proof gal.

NOTE.—The rate fixed in the Tariff Act of 1930 was \$5 per proof gallon. Effective January 1, 1933, the rate on whisky aged in wooden containers 4 years or more, was reduced to \$2.50 per proof gallon, pursuant to the Canadian trade agreement. Whisky under 4 years old became subject to the \$2.50 rate on January 30, 1943, pursuant to the trade agreement with Mexico.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 proof gallons).....	104,100	221	103,948	9,546	113,794	Percent 8.7
Value (\$1,000).....	(?)	610	(?)	41,543		
Unit value (per proof gallon).....	(?)	\$2.76	(?)	\$4.22		

¹ Tax-paid withdrawals plus increase by rectification, fiscal year beginning July 1, 1939, plus exports in 1939.

² Not available.

³ Foreign value.

In the United States whisky is by far the most important of the distilled beverages, both in domestic production and in imports. The imports of whisky are among the most important of all dutiable United States imports, and whisky is by far the largest item among United Kingdom exports to the United States.

Although the United States distilling industry is equipped to produce all the whisky the market will take, there has been since the repeal of prohibition a strong demand for Scotch and Canadian whiskies, notwithstanding the fact that their prices exceed those of most domestic whiskies by more than the amount of the duty (\$2.50 per proof gallon). The United Kingdom and Canada have furnished nearly all of the imports, in the proportion of approximately three-fourths and one-fourth respectively. On the basis of quantity, imports made up about 9 percent of the total apparent consumption in 1939.

Owing to the vast wartime need for industrial alcohol, all distillation of whisky in the United States was discontinued as of October 8, 1942, and the distillers shifted to the production of alcohol. Since that date, the only distillation of whisky or neutral spirits for beverages has been during the months of August 1944 and January 1945. The domestic whisky appearing on the retail market since October 1942 has come out of stocks, and an increasing part of it has been blended whisky containing usually 30 to 35 percent straight whisky, the remainder being neutral spirits.

Consumption of whisky is materially affected by the price, which in turn is influenced much more by the internal revenue tax than by the duty or cost of production. Hence it is necessary, in arriving at the estimates made below, to assume some rate for the internal

revenue tax. In 1939 the tax was \$2.25 per proof gallon. It is now \$9, but the present law provides that at the end of the war it shall revert automatically to an earlier status of \$6 per gallon, and it has been assumed in this report that this rate will be in effect thereafter. If the tax should revert to the pre-war figure, or if it should remain at the present figure, consumption would be appreciably affected.

POST-WAR SHORT TERM

During the present war the supply of alcoholic beverages available on the market has been less than the demand for them, and the consumption of whisky has recently fallen below the pre-war level. Because of reduction of stocks of domestic whisky during the war, the supplies of aged whisky will undoubtedly continue to be relatively short for 3 or 4 years after the resumption of distilling at normal rates, although supplies of the cheaper whiskies (particularly neutral spirit blends) may be adequate. Since stocks of Scotch whisky in Scotland have been considerably depleted during the war, and since Scotch is marketed only after long aging, only relatively low supplies from that source can be expected for 4 to 6 years after distilling is resumed there on a substantial scale. The latest information available indicates that stocks of Canadian whisky have declined but little during the war; consequently imports from Canada in the immediate post-war period may be somewhat higher than in the years immediately before the war.

Assuming that per capita real income in the immediate post-war years will be approximately at the present level, or about 40 percent greater than in 1939, the consumption of whisky, provided supplies are available, will probably be somewhat above the 1939 level, despite the higher prices resulting from the assumed increase in the internal revenue tax from \$2.25 to \$6. Because of scarcity of supplies of Scotch whisky abroad, total imports may be somewhat smaller than before the war. The annual production of domestic whisky (as distinguished from the current distillation of new whisky, which may be much greater than production, as the term is used in this report; see footnote 1 of the foregoing tabulation) will probably considerably exceed the production in 1939; shortage of imports would tend to make the sales of the domestic product somewhat larger than otherwise, although the foreign and domestic types are by no means fully interchangeable in consumer demand.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The per capita consumption of whisky in this period is problematical; the higher prices assumed as a result of a higher internal revenue tax than before the war might cause a lower per capita consumption. Despite the increased tax, however, per capita consumption might prove to be higher. Taking account of population growth, total consumption might be in the range of 105-120 million proof gallons. If imports bore about the same relation to consumption as before the war (assuming the duty to be the same as in 1939), they might be about 9½-11 million proof gallons, with a foreign value (at the 1939 unit value) of about 40-47 million dollars.

Changes in the price of imported whisky in consequence of changes in duty would not greatly affect the price of domestic whisky and would probably not appreciably affect the total consumption of whisky. Such duty changes would, however, probably affect substantially the quantity of imports. If the duty were reduced by 50 percent, imports would perhaps increase (assuming duty changes to be fully reflected in the duty-paid landed price, although such would not necessarily be the case) by 1½-3 million proof gallons, bringing total imports up to 11-14 million gallons, with a foreign value (roughly) of 47-60 million dollars. If the duty were increased by 50 percent, imports would decrease by perhaps 1-2 million gallons, with total imports thus amounting to about 7½-10 million gallons, with an approximate foreign value of 30-45 million.

Per capita income 75 percent higher than in 1939.

At this income level, notwithstanding prices assumed to be much higher than in 1939 (by reason of the higher tax), per capita consumption of whisky would probably be 15 to 25 percent greater than before the war, and, taking account of the increase in population, total consumption might increase by roughly 25 to 40 percent over that in 1939, amounting to between 140 and 160 million proof gallons. Most of this would, of course, be domestic whisky, although the prestige of foreign brands would probably cause the demand for imported whisky to go up relatively more than that for the domestic product.

With no change in the duty, imports might be from 40 percent to as much as 75 percent greater than in 1939, total imports thus perhaps amounting to 14-17 million proof gallons. Assuming that the average foreign unit value would be 10 to 15 percent higher than in 1939, the total foreign value of imports might be in the range of 65-83 million dollars.

As in the assumptions made under the 1939 income level, duty changes of 50 percent would probably not have much effect on the price of domestic whisky, or upon the total consumption. They would, however, be likely to have a substantial effect upon the share of imports in consumption. A reduction in the duty might increase imports by perhaps 2-4 million gallons, bringing the total imports up to a level of 16-21 million gallons, with a foreign value of, say, 75-100 million. An increase in the duty might result in a reduction of imports by perhaps 1½-3 million gallons, with total imports thus amounting to about 12½-14 million gallons, with a foreign value of 50-75 million dollars.

Exports

Relatively small quantities of whisky have been exported, and these exports occur largely on account of the demand for United States brands by United States nationals abroad. Before the war most of the exports went to Canada. During 1942 and 1943 exports were slightly higher in quantity, and much higher in value, than in 1939. It is to be expected that more United States nationals will be abroad after the war than before; consequently, the exports of United States whisky probably will be somewhat higher after the war than in 1939.

Employment

No information is available upon employment in the whisky industry.

CORDIALS AND LIQUEURS

Tariff paragraph: 809.

Commodity: Cordials, liqueurs, kirch-
wasser, and ratafia.

Rate of duty: \$2.50 per proof gallon. Equivalent ad valorem (1939): 50%.

Note.—The rate fixed in the Tariff Act of 1930 was \$5 per proof gallon, which was reduced to \$2.50 per proof gallon effective June 15, 1934, pursuant to the trade agreement with France.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below.

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export			
Quantity (1,000 proof gallons).....	1,488	(¹)	301	2,789	Percent 11.0
Value (\$1,000).....	(²)	(³)	1,578		
Unit value (per proof gallon).....			\$5.07		

- ¹ Fiscal year beginning July 1939.
- ² Not available.
- ³ Negligible.
- ⁴ Foreign value.

Cordials and liqueurs are made by flavoring spirits with sugar and flavoring materials—natural fruits, spices, aromatics, essences, and so on. The higher grades are made by redistilling the spirit with the flavoring materials and afterward rectifying the product by sweetening, flavoring, and blending. The cheaper types are made by so-called compounding—the simple mixing of sugar and other flavoring materials with spirits. The bulk of the United States output is said to be compounded, some of it in recent years through the use of imported gin, rum, and neutral spirits. Nearly all cordials imported before the war were distilled types, and the prices at which they were retailed made them distinctly luxury beverages; imports during the war have been of somewhat lower grade and price. Cordials are usually bottled at 60 to 70 proof. Because of their sweetness and high flavor they are usually consumed in relatively small quantities.

Present wartime consumption of cordials in the United States is approximately 4 million proof gallons—about two-thirds more than in the fiscal year 1939-40. Production increased from 2.4 million gallons in 1939-40 to 4 million in 1942-43 and 1943-44. Imports, however, dropped from about 300,000 proof gallons annually before the war to 65,000 gallons in 1942; they have since increased to nearly 200,000. Formerly the imports came principally from France; at present (1945) Argentina is the principal source.

The internal revenue tax on liqueurs, as on other distilled liquors, domestic and imported, was increased from \$6 per proof gallon to \$9 per proof gallon, effective April 1, 1944. Under the terms of the present law the rate is to return to \$6 six months after the end of the war, and it is assumed that this is the rate which will be in effect in both the short- and long-term post-war periods. In 1939 this tax was

only \$2.25 per proof gallon, approximately 32 cents per fifth of cordial as bottled; the \$6 post-war rate will be equivalent to about 86 cents per fifth. The higher price, resulting from the higher tax, would tend to lower consumption somewhat after the war. On the other hand, the consumption of cordials and liqueurs, which are comparatively high-priced specialty products, would probably be less affected by the higher prices than would that of most other distilled beverages.

POST-WAR SHORT TERM

The increased consumption of liqueurs during the war probably resulted in large part from the increased demand for alcoholic beverages generally, together with the limited supply of some of them. As the supply of other alcoholic beverages increases, the production and consumption of liqueurs may fall below the wartime level of 4 million proof gallons, but may remain somewhat above that of 1939. Imports, which probably will again consist principally of high-priced specialties, may be about the same as in 1939 if supplies abroad are available.

POST-WAR LONG TERM

Consumption, Production, and Imports

Under the 1939 level of consumer income, production would probably not be much affected by such relatively moderate price changes as might be expected from 50-percent changes in the duty, especially in view of the high internal revenue tax.

Per capita income at 1939 level.

Duty as in 1939.—Total consumption probably would be approximately the same as in 1939, perhaps 2.7–3.0 million proof gallons, of which perhaps 2.4–2.6 million would be supplied by domestic production and about 300,000–400,000 by imports. At the 1939 level of prices the foreign value of the imports might thus be 1.5–2.0 million dollars.

Duty reduced by 50 percent.—Domestic production probably would be about the same as with the duty at the 1939 level. Imports and consumption might be higher than under no-duty change by about 100,000 proof gallons, making consumption from 2.8–3.1 million proof gallons, and imports 400,000–500,000 proof gallons, with a foreign value, at 1939 prices, of 2.0–2.5 million dollars.

Duty increased by 50 percent.—Under these assumptions domestic production would probably be about the same as with the duty unchanged, but imports and consumption might be about 100,000 gallons less than under no-duty change, making consumption 2.6–2.9 million proof gallons, and imports 200,000–300,000, with a foreign value, at 1939 prices, of 1.0–1.5 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of liqueurs may be expected to respond to changes in consumer-income levels which are maintained over a considerable period of time.

Duty as in 1939.—Total consumption would probably be considerably greater than under the lower income level, perhaps 4–6 million gallons (50 to 120 percent higher than in 1939) and imports, because

they are more of luxury grades, would probably supply a somewhat greater proportion. Domestic production might supply 3.3-4.8 million gallons of the total and imports from 700,000 to 1.2 million, the latter having a foreign value, at prices 10 to 15 percent higher than in 1939, of 3.9-7.0 million dollars.

Duty reduced by 50 percent.—Domestic production would probably be about the same. Imports and consumption probably would be higher than under no duty change by approximately 100,000 proof gallons, making consumption 4.1-6.1 million gallons and imports between 800,000 and 1.3 million, with a foreign value, at prices 10 to 15 percent higher than in 1939, of 4.5-7.5 million dollars.

Duty increased by 50 percent.—Imports and consumption might be about 100,000 proof gallons lower than with the duty as in 1939—3.9-5.9 million proof gallons for consumption and 600,000 to 1.1 million gallons for imports. At 10 to 15 percent higher prices than in 1939, imports would thus have a foreign value of approximately 3.3-6.4 million dollars. Domestic production probably would remain about the same as with no change in duty.

Exports

Exports, if any, are not reported separately.

Employment

The number of persons employed in this industry is not known. Changes in the level of production would cause less than proportional changes in employment.

SPARKLING WINES

Tariff paragraph: 803.

Commodity: Sparkling wines.

Rate of duty: \$3 per gallon.

Equivalent ad valorem (1939): 67%.

NOTE.—The rate of duty fixed by the Tariff Act of 1930 was \$6 per gallon, which was reduced to \$3, effective June 15, 1936, pursuant to trade agreement with France.

GENERAL

Data on United States production, imports, and production for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 gallons).....	1 420	(?)	420	560	980	Percent 57
Value (\$1,000).....	(?)			2,526		
Unit value (per gallon).....				\$4.50		

¹ Tax-paid withdrawals, fiscal year beginning July 1, 1939.

² Less than 500 gallons.

³ Not available.

⁴ Foreign value.

Sparkling wines, so called because of a tendency to effervesce owing to the presence of carbon dioxide in solution, may be either white or red wines, but both domestic production and imports are predominantly of the white type. Sparkling wines differ in the method of carbonation. In the traditional method the carbon dioxide is produced by secondary fermentation induced in the bottle by the introduction of sugar solution and yeast before sealing. In recent years two other methods have attained some importance. In one of these—the bulk method—natural carbonation is obtained by secondary fermentation in large closed tanks, and the bottling is done in such a way as to retain the gas charge. In the third method, the carbon dioxide is charged into the wine artificially by the same method as is used in the production of soda water. Sparkling wines produced by the bottle method, the only ones which under United States laws may be labeled "champagne," are considerably higher priced than those produced by the other methods and have greater prestige; they are also more costly to produce.

Pre-war imports of sparkling wines came mainly from France. These wines carried the high reputation associated with the areas of France famous for their champagne. Practically all were produced by the bottle method and commanded prices in the American market substantially above even the highest priced domestic sparkling wines. The greater part of the United States output of sparkling wines also is produced by the bottle method, but about 33 percent is produced by the bulk process and about 7 percent is artificially carbonated.

Before the war United States consumption was approximately a million gallons annually, of which slightly more than one-half, on the basis of quantity (but much more than one-half on the basis of value), was supplied by imports. During the war total consumption has increased about 75 percent, imports have declined 80 to 85 percent, and domestic production has increased about threefold.

The internal revenue tax on champagne or other natural sparkling wine, domestic and imported, will, presumably, be somewhat higher after the war than in 1939. In 1939 this tax was 40 cents per gallon. The present (1945) rate is \$2.40 per gallon, but under the law it is to be reduced to \$1.60 per gallon 6 months after the end of the war. This rate will be equivalent to 32 cents per fifth, as compared with 8 cents per fifth under the 1939 tax. A tax of 32 cents per fifth will probably affect consumption in the post-war period very slightly.

Because sparkling wine is relatively low in alcohol content—usually not more than 14 percent—and relatively high in price, it is seldom used as a substitute for other alcoholic beverages. Consequently the 75-percent increase in consumption during the war apparently was not caused by the general shortage of distilled beverages but rather by the high consumer income.

POST-WAR SHORT TERM

Consumption may be somewhat higher than at present (1945), or about 75 percent higher than in 1939, even though the champagne area of France will probably not be able to export champagne in as large quantities as before the war, because of the depletion of stocks during the war, and because of the time required for aging champagne. Domestic production in this period may be approximately three times as great as in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Domestic production would probably not be greatly different under the different levels of duty contemplated under Senate Resolution 341. Both domestic and imported sparkling wines are, however, luxury products for which the demand probably would be substantially greater at high than at low levels of national income.

Per capita income at 1935 level.

Many more people have become accustomed to the use of sparkling wines during the war. Consequently domestic production may be substantially higher than in 1939—possibly reaching a level of about 800,000 to 1.2 million gallons.

Duty as in 1939.—Imports might be 600,000–800,000 gallons, with a foreign value, at unit prices as of 1939, of approximately 2.7–3.6 million dollars.

Duty reduced by 50 percent.—Imports might be as much as 200,000 gallons higher than with no duty change, or between 800,000 and 1 million gallons, with a foreign value, at 1939 unit values, of 3.6–4.5 million dollars.

Duty increased by 50 percent.—Imports might be approximately 100,000 gallons lower than with no duty change, or from about 500,000 to 700,000 gallons, with a foreign value, at 1939 unit values, of about 2.2–3.1 million dollars.

Per capita income 75 percent higher than in 1939.

Domestic production of sparkling wines at this level of income may be 50 percent or more higher than with income as in 1939, say, 1.2–2.0 million gallons.

Duty as in 1939.—Imports, being even more of a luxury character than the domestic product, might be as much as 100 percent greater than with income as in 1939, possibly 1.2–1.6 million gallons. At unit prices 10 to 15 percent higher than in 1939 they might have a foreign value of approximately 6–8 million dollars.

Duty reduced by 50 percent.—Imports might be about 300,000 gallons higher than with no duty change, or 1.5–1.9 million gallons, with a foreign value of approximately 7–10 million dollars.

Duty increased by 50 percent.—Imports might be approximately 150,000 gallons lower than with no duty change, or roughly 1.0–1.5 million gallons, with a foreign value of 5–8 million dollars.

Exports

Exports are not, and are not likely to be, important, although they have increased somewhat during the war.

Employment

The United States Bureau of the Census reported 3,491 workers in the wine industry in 1939, of whom 2,056 were reported as wage earners. Probably less than 5 percent of these workers were in establishments concerned with sparkling wines.

STILL WINES (INCLUDING VERMOUTH)

Tariff paragraph: 804.

Commodity: Still wines (including vermouth).

Rate of duty: From 62½¢ to \$1.25 per Equivalent ad valorem (1939): 43% gal.

NOTE.—The rate fixed in the Tariff Act of 1930 on still wines and vermouth is \$1.25 per gallon. Effective June 15, 1936, the rate on still wines of 14 percent or less alcohol content, in containers of 1 gallon or less, was reduced to 75 cents per gallon, pursuant to the trade agreement with France. The rate on vermouth in containers of 1 gallon or less was also reduced pursuant to the French agreement to 62½ cents per gallon.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Estimated consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 gallons).....	1 80,763	87	80,676	3,257	2 76,185	Percent 4.3
Value (\$1,000).....	(7)	60		4 6,421		
Unit value (per gallon).....		\$0.69		\$1.97		..6.....

¹ As reported by the California Agri. Expt. Sta., Berkeley.

² As reported by the Wine Institute. Refers to estimated current (actual) consumption, and not to "apparent" consumption. Because considerable wine is aged for variable periods, "apparent consumption" (production minus exports plus imports) is not a good measure of current consumption.

³ Not available.

⁴ Foreign value.

The United States does not rank high in world production or international trade in wines. Production in this country reached a peak of 118 million gallons in 1941. By contrast, the annual production in France (with about one-third as large a population) before the war averaged over 1,500 million gallons. United States imports before the war were about 3 million gallons annually, and exports less than 100,000 gallons; but both imports and exports have increased considerably since the war began.

During pre-war years, nearly one-half of the imports consisted of vermouth, practically all of which, after the duty on bottled vermouth was reduced from \$1.25 to 62½ cents per gallon (in the French trade agreement effective June 15, 1936) entered in bottles; the duty on wine in casks being unchanged. Table wines (still wines containing not more than 14 percent of alcohol) also entered principally in bottles, largely because of the reduction in duty on such wine in bottles from \$1.25 to 75 cents per gallon in the same trade agreement. The duty on dessert wine (wine containing more than 14 percent, but not more than 24 percent, of alcohol, chiefly sherry and port) has not changed, but remains at \$1.25 per gallon as in the Tariff Act of 1930. France, Italy, Spain, Germany, the United Kingdom, and Portugal, in the order named, were the principal sources of pre-war imports. In general, the imports were products of high price or prestige.

United States production of wine has dropped sharply since 1941, even falling below the 1939 level, largely because of the Government requirement that raisin grapes be used for raisins and not wine.

The low level of domestic production, coming as it did at a time of general shortage in alcoholic beverages, caused a phenomenal increase in imports of dessert wines from Spain and Portugal in 1944.

POST-WAR SHORT TERM

As aged whisky will be scarce in this period, it may be expected that distilled beverages in general will be in relatively short supply. Consequently, there will be an unusual demand for vermouth and other dessert wine for use as a substitute for distilled liquors. In consequence of this special demand, with the resulting high prices, and to replenish depleted stocks of wine for aging, domestic production of still wine will probably be much above wartime levels. If the production of grapes is sufficient, actual consumption may be 60 to 75 percent higher than in 1939, amounting to perhaps 120-135 million gallons, but domestic production may be 60 to 85 percent higher than in 1939, amounting to perhaps 130-150 million gallons. Imports will probably consist more largely of high-quality wines than during the war, when large quantities of ordinary grades were imported to supplement short domestic supplies. In view of the probability that wines of high quality may be relatively scarce in Europe, imports may be less in quantity than during the war, but larger than in 1939; they may amount to perhaps 5-7 million gallons, with a foreign value, at prices higher than in 1939, of 12-17 million dollars.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita consumption of wine is much lower in the United States than in many other countries; in 1939 it was only about 0.6 gallon per capita, compared with an approximate pre-war per capita consumption of 30 to 40 gallons in France. It is likewise low as compared with per capita consumption in the United States of other alcoholic beverages and soft drinks—1 gallon of distilled liquors, 6 gallons of soft drinks, and 12 gallons of beer. Immediately before the war United States production and consumption of wine was increasing rapidly, and the belief is general in the trade that, when normal conditions of production and trade are resumed, the upward trend in consumption will continue.

Prices of wine, moreover, are likely to be somewhat higher and firmer than before the war. Because of considerable investment in the wine industry by financially strong members of the distilled liquor industry, and because of good returns during the war, the wine industry is in a stronger financial position than it was before the war. Consequently, distress sales and price wars will probably be less common. Furthermore, under the provisions of the present law, internal revenue taxes are to be higher; the tax on dessert wine is to be 40 cents per gallon, compared with 10 cents in 1939, and it is assumed that this rate will continue in effect during the long-term post-war period.

Probably imports will again consist almost entirely of high-priced wines and specialties; probably vermouth from France and Italy will again predominate.

Per capita income at 1939 level.

Despite a probable upward trend in consumption of wine with change in consumption habits and improvement in quality of the domestic product, total consumption of wine, taking account of increased population, probably would not be more than 40 to 65 percent higher than in 1939, or about 105-125 million gallons. It appears likely that imports (with duty as in 1939) may be from 25 to 50 percent more than in 1939, or 4-5 million gallons, with a foreign value (at 1939 unit values) of 8-10 million dollars. Domestic production, therefore, would probably be about 100-120 million gallons.¹

In view of the fact that imports are normally relatively high in price and are consumed mostly by classes of people to whom price is not the primary consideration, it appears likely that the relatively small changes in price which might result from 50 percent changes in the duty would cause but little change in the demand for imported wine. The effect of such changes on the annual volume of imports probably would not exceed 0.5-1.0 million gallons (the unit value of the imports probably would be about the same as in 1939), and the effect upon total consumption and domestic production would be negligible.

Income 75 percent higher than in 1939.

Under this income, consumption of wine might be 70-110 percent higher than in 1939, or 130-160 million gallons. The consumption of high-priced imported wines would probably increase to a greater extent than total consumption. Imports might supply 8-10 million gallons, representing an increase of roughly 150-200 percent in volume over 1939, and have a foreign value, at prices presumably 10-20 percent higher than in 1939, of possibly 17-24 million dollars. In this case domestic production would be approximately 120-150 million gallons.

It appears probable that a change in the duties of 50 percent, though perhaps affecting the quantity imported by as much as 1-2 million gallons annually, would affect total consumption and domestic production only slightly. The unit value of the imports probably would be about the same as under no duty change.

Exports

Although exports have increased several fold since the war began, they are still small, averaging slightly more than 600,000 gallons during 1940-43. The exports consist mostly of low-priced wine. Domestic producers probably will be able to hold most of this trade after the war, and may even be able to increase it to about a million gallons.

Employment

According to the United States Census, 3,491 persons were employed in the wine industry in 1939, of whom 2,056 were classified as wage earners. Probably more than 95 percent of the total workers were engaged in still wine production.

Change in the volume of still wine production would cause much less change, relatively, in the number employed.

¹ That is, production ready for consumption, which may be more or less than current production.

ALE, PORTER, STOUT, AND BEER

Tariff paragraph: 805.

Commodity: Ale, porter, stout, and (principally) beer.

Rate of duty: 50¢ per gal. *Equivalent ad valorem (1939): 57%.*

NOTE.—The rate fixed by the Tariff Act of 1930 was \$1 per gallon, which was reduced to 80 cents, effective February 15, 1935, by Presidential proclamation under section 336 of the tariff act. The rate was further reduced to 25 cents per gallon, effective January 30, 1943, pursuant to trade agreement with Mexico.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 gallons).....	1,639,288	700	1,638,579	1,994	1,640,583	Percent 0.1
Value (\$1,000).....	1,511,440	446	510,994	* 1,468		
Unit value (per gallon).....	1 \$0.31	\$0.63	\$0.31	\$0.84		
Persons employed (number).....	41,911					

* The value given in the table is reported by the United States census. The estimated value of the beer as ready for consumption, based on the unit value estimated by the U. S. Tariff Commission for inclusion in the summary table given in the introduction is considerably higher.

* Foreign value.

The United States is by far the largest producer and consumer of fermented malt liquors in the world. Since the repeal of prohibition, consumption has tended to vary directly with the national income: it increased from about 1.3 billion gallons in the fiscal year 1934-35 to about 1.7 billion in 1936-37, declined to approximately 1.6 billion in 1938-39, and rose again to about 2.6 billion gallons in 1943-44. Imports, as well as exports, are very small relative to domestic production. In 1939 exports were only about one-third as much as imports. The manufacture of malt liquors is a large-scale and highly mechanized industry.

Before the war the greater part of the imports consisted of specialty products, either special types like ale, porter, and stout, principally from Ireland and the United Kingdom, or special kinds of beer, such as Pilsener, Wurzberger, and Muenchener, mostly from Germany, Czechoslovakia, and the Netherlands. These imported specialties commanded considerably higher prices in the United States markets than domestic products. In addition, substantial quantities of ordinary-type beer were imported from Japan into Hawaii. During the war imports, principally from Mexico and Canada, have increased to more than four times the average annual imports during 1937-40. These wartime imports have consisted mostly of ordinary-type beer, similar to the bulk of the domestic beer. This increase resulted in part from the increased demand and in part from the 50 percent reduction of the duty in the Mexican trade agreement (effective January 1943). The present (1945) duty of 25 cents per gallon is slightly less than the internal revenue tax of \$8 per barrel of 31 gallons (25.8 cents per gallon), which is levied against domestic but not against imported beer. Under present law this tax is to return to \$7 per barrel (22.6 cents per gallon) 6 months after the end of the war, and it is assumed in this report that this rate of tax will be in effect in the long term.

POST-WAR SHORT TERM

During the fiscal year 1942-43 United States production of malt liquors surpassed the previous peak, established in 1914. At present (1945) consumption is apparently at the rate of about 2.6 billion gallons (84 million barrels) annually, which is approximately 20 percent more than in 1914, and about 60 percent more than in 1939. This phenomenal increase in consumption of beer during the war has been due mainly to the relatively high consumer income and to the shortage of several other alcoholic beverages relative to the demand for them. During the short term there probably will be no particular shortage of alcoholic beverages, with the exception of certain aged distilled liquors. It appears probable, therefore, that imports, production, and consumption of malt liquors in this period will be lower than at present but substantially higher than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

During the war more persons became accustomed to drinking beer, and as a result the per capita consumption of beer may remain somewhat higher than before the war, perhaps 10 percent higher, even with no increase in per capita income. Allowing for increase in population, consumption might be in the vicinity of 2 billion gallons. Domestic production would supply nearly all of this under any assumption regarding duties. It is unlikely that imports would, under any conditions of duty contemplated herein, supply as much as 1 percent of the total consumption. If the duty should again be fixed at the 1939 rate (50 cents per gallon), imports probably would again, as before the war, consist largely of European specialties. If this rate were increased 50 percent, to 75 cents per gallon, only the higher priced of these specialties could enter; and if it were lowered 50 percent to 25 cents per gallon (the present rate), it would be only slightly higher than the internal revenue tax which it is assumed will be 22.6 cents per gallon, at that time, and imports of ordinary-type beer from Mexico, Canada, and Japan might enter in substantial quantities.

Duty as in 1939.—Since the imports of European specialties were decreasing even before the war, the imports, if the duty were restored to the 1939 rate, would probably be about 1.8 million gallons, with a total foreign value, at unit prices as of 1939, of 1.5 million dollars.

Duty reduced by 50 percent.—If the present reduced duty remains in force, imports might be as high as 5 million gallons, with a foreign value as high as 3 million dollars; the average unit value would be materially lower than if the 1939 rate were in effect, because more low-priced beer would enter.

Duty increased by 50 percent.—Imports probably would not be more than about a million gallons, with a foreign value of probably around a million dollars, only high-priced beverages entering.

Per capita income 75 percent higher than in 1939.

Consumption might be as much as 40 percent higher than at the 1939 income level, in which case it would be about 2.8 billion gallons. Domestic production would supply all of this except about 2-5 million gallons. The imports might under these conditions include a

somewhat larger proportion of the higher priced beverages from Europe than under the lower income level.

Duty at 1939 level.—Imports might be as high as 3 million gallons, and their foreign value about 3 million dollars.

Duty reduced by 50 percent.—Imports would probably be much higher than under the 1939 duty level, say, 8 million gallons, with a foreign value of about 6 million dollars.

▶ *Duty increased by 50 percent.*—This level of duty probably would exclude all ordinary-type beer. Imports probably would not exceed 2 million gallons, with a foreign value of about 2½ million dollars.

Exports

The exportation of beer has been a small trade, generally confined to Central American countries and others having a substantial number of North American residents or travelers. In the short term this trade will probably remain close to the present (1945) level of about 1.5 million gallons, which is double the exports in 1939. In the long term it will probably be somewhat less than 1.5 million gallons at the 1939 income level, and somewhat more than 1.5 million gallons at the 75 percent higher income level.

Employment

The beer industry in the United States is largely mechanized. The United States census reported that in 1939 a total of 41,911 salaried officers, employees, and wage earners were engaged in the manufacture of malt beverages for the 605 manufacturing concerns reporting, or about 70 per establishment. Of these, 36,088 were reported as wage earners. Because of increasing mechanization in the industry, employment is not likely to increase proportionately to the increase in production. On the basis of the assumed volume of production in the long-term post-war period, it is estimated that the number of people employed might range between 65,000 and 75,000 people, depending on the lower or higher assumption as to national income.

MINERAL WATERS

Tariff paragraph: 809.

Commodity: Mineral waters.

Rate of duty: 10¢ per gal.

Equivalent ad valorem (1939): 15%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 gallons).....	(1)	96	(1)	372	(1)	Percent (1) 5.3
Value (\$1,000).....	\$ 4,500	71	\$ 4,429	\$ 247	4,676	
Unit value (per gallon).....		\$0.72		\$0.66		

1 Not available.
 2 Estimated.
 3 Foreign value.

The trade in mineral waters has been declining during the past two or three decades. During 1906-14 the total value of imports was a million dollars or more annually; in 1939 it was only one-fourth as much. The sales of domestic mineral waters during the early 1920's (exclusive of the quantities used in soft drinks and furnished to guests by hotels, resorts, and sanatoriums) approximated 5 million dollars annually; in 1923 they amounted to 44 million gallons, valued at 6.5 million dollars—5.6 million for table waters and 0.9 million for medicinal waters.¹ Although statistics are not available, reports from the trade indicate that since about 1926 the trend of domestic production and sales has been downward. Exports also have declined from \$190,000 in 1923 to \$71,000 in 1939.

Imports, which have come principally from France, have consisted mostly of the medicinal type, largely of established and well-known brands having a prestige value because of their reputation. On the other hand, the domestic mineral waters which have entered commercial trade have for many years been mostly table water.

POST-WAR SHORT TERM

In view of the long-time decline in the domestic use of mineral waters, it appears likely that United States consumption would not exceed that of 1939. Most of the demand may be expected to be supplied by domestic products. The extent to which imports, which ceased during the war, will revive in the immediate post-war years will depend upon the quickness with which the European mineral water industry resumes operations, and the effect that enforced cessation of the use of the imported product during the war will have had on the domestic demand. The probabilities seem to be that imports will be less than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

United States consumption will probably be considerably less than in 1939. Sales of both domestic and imported waters will probably continue their downward trend.

A change in the duty of 50 percent (5 cents per gallon) in either direction would probably have no appreciable effect upon the volume of imports. The imported product, particularly, is a semiluxury; a small increase in the price would probably not appreciably diminish purchases by persons who want the product; and a small decrease in price would be likely to attract few, if any, new buyers.

Per capita income 75 percent higher than in 1939.

The total value of mineral waters consumed in the United States might rise somewhat above that in 1939 but not in proportion to the rise in national income. In this situation, imports might exceed somewhat the 1939 level of approximately \$250,000.

As stated above, changes in the duty within the limits set would probably have little, if any, effect.

Exports

Exports of mineral waters are unimportant.

Employment

No statistics of employment in this industry are available.

¹ U. S. Department of Interior, *Mineral Waters in 1923, 1924.*

SCHEDULE 9. COTTON MANUFACTURES

INTRODUCTION AND SUMMARY

All items covered by schedule 9 of which the imports in 1939 exceeded \$100,000 are covered in this report.

The total number of items for which reports are presented is 18. The total value of the imports of these items in 1939 was 23.8 million dollars, out of a grand total of 27.3 million dollars imported under this schedule.

Short-staple cotton, which is duty-free, and long-staple cotton, which is subject to duty, are included with the sections on schedule 7.¹

The following tabulation summarizes the statistics for 1939 for articles dutiable under schedule 9, together with estimates of production and imports in the post-war period under the several assumptions with respect to national income and levels of duty:

Period, income level, and tariff treatment	Production for the domestic market		Imports	
	Value	Ratio to 1939	Foreign value	Ratio to 1939
<i>Cotton manufactures, dutiable</i>	<i>Million dollars</i>	<i>Percent</i>	<i>Million dollars</i>	<i>Percent</i>
1939.....	2049.5	100	23.8	100
Post-war long term:				
Per capita income as in 1939:				
Duty as in 1939.....	2646.7	129	25.5	109
Duty reduced 50 percent.....	2450.9	120	22.6	97
Duty increased 50 percent.....	2565.3	125	22.2	93
Per capita income 75 percent higher than in 1939:				
Duty as in 1939.....	3515.6	172	66.3	279
Duty reduced 50 percent.....	3328.2	166	143.1	602
Duty increased 50 percent.....	3535.2	172	20.4	106

The sum of the 1939 figures of production as given in this table is 2,049 million dollars, but this total involves extensive duplication of articles in different stages of manufacture, particularly those of yarn and cloth, and cloth and wearing apparel. It is roughly estimated that without such duplication the value of the domestic production in 1939 would have been about 1,000 million dollars. The foreign value of the imports was 23.8 million dollars, equal to about 2½ percent of the adjusted figure for domestic production. If duties and importation charges were added to the foreign value of imports, this ratio would be raised considerably, perhaps to about 3½ percent.

In 1939 there was a fairly wide dispersion in imports of the various dutiable items, or groups of items, here covered. Of the total im-

¹ In 1939 the value of production of short-staple cotton for the domestic market was 219 million dollars, and that of the imports 2.8 million; for long-staple cotton the corresponding figures were 23.8 million dollars and 4.7 million. The post-war estimates for imports of short-staple cotton show no great change from pre-war figures. It is estimated that a 50 percent change in the rate of duty on long-staple cotton, in either direction, would have a fairly important effect on imports.

ports, valued at 23.8 million dollars, two items, countable cotton cloth (\$8,700,000) and cotton floor coverings (\$4,440,000), accounted for more than half, but the remainder included more than a million dollars worth of imports in each of such items as quilts or bedspreads, table damask, knit gloves, yarn, and tapestries. Of production for the domestic market, in which the total-value figures include a large amount of duplication, the largest items are cotton yarn (746 million dollars), countable cotton cloth (603 million), cotton wearing apparel (545 million), and cotton hosiery (74 million).

It is estimated that, with no increase in income and with duties as in 1939, the value of domestic production of cotton manufactures in the long-term post-war period would exceed the value in 1939 by 24 percent. However, this increase is largely attributable to probable higher prices of these articles, resulting from a higher price for raw cotton; in terms of quantities, the increase would probably be no greater, and perhaps somewhat less, than the (estimated) 10 percent increase in population. It is probable that the competition of articles made from rayon and other synthetic fibers with those made from cotton will be even more important in the post-war period than before the war. It is estimated, on these same assumptions, that the value of imports would be nearly 50 percent greater in the post-war period than in 1939. This increase is partly because of higher prices but also because certain reductions in duty made in the trade agreement with the United Kingdom, effective January 1, 1939, will probably have more influence on imports in the post-war period than they were able to exert in the year 1939 itself.

The estimates indicate that with national income 75 percent higher than in 1939, and with no change in duties, the domestic production of articles dutiable under this schedule would be about 40 percent greater, in value, than at the lower income level, while the value of imports would be nearly twice as great at the higher income level. The disparity between these two ratios of increase is attributable to the fact that high-grade goods are relatively more important in imports than in domestic production, and high national income would cause particularly strong demand for high-grade articles. The excess of the estimates for both production and imports at the higher income level over those at the lower level is in relatively small part attributable to a difference in prices at the two income levels; it reflects mainly larger quantities.

The post-war estimates indicate that the effects of a 50-percent increase or a 50-percent decrease in duties upon the value of domestic production and the value of imports would be considerable. Of course if national income were 75 percent greater than in 1939, and at the same time rates of duty 50 percent lower than in that year, the cumulative effect in increasing the value of imports above that in 1939 would be greater.

The summary estimates in the above table are subject to an appreciable margin of error. However, the number of items is large and there are several of major importance, so that errors in the estimates for individual items may tend to offset each other.

COTTON YARN

Tariff paragraph: 901.

Commodity: Cotton yarn.

Rate of duty: 5.3% to 30% ad val.

Average ad valorem (1939): 28%.

NOTE.—The rates fixed in the Tariff Act of 1930 varied according to yarn number. On yarn not bleached, colored, plied, etc., the rates ranged from 8.3 to 32 percent ad valorem; on those bleached, colored, plied, etc., the rates ranged from 10.3 to 37 percent ad valorem. An additional duty of 10 cents per pound was also imposed on cotton contained in yarns which was of 1¼ inches or more in staple length. The rates on all yarns exceeding number 60 were reduced, according to yarn-number brackets, pursuant to the trade agreement with the United Kingdom, effective January 1, 1939. The additional duty on long-staple cotton contained therein was not affected, and it is not included in the computation of the average ad valorem rate shown above.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	3,101	9.9	3,091	1.6	3,093	Percent 10.05
Value (million dollars).....	\$ 750	3.6	\$ 746	\$ 1.3		
Unit value (per pound).....	\$0.24	\$0.36	\$0.24	\$0.80		
Persons employed (number).....	\$ 275,000					

¹ That is, one-twentieth of 1 percent.

² Estimated.

³ Foreign value.

The bulk of the cotton yarns spun in the United States are used by the producing mills for further manufacture into cloth or other end products. Of 3,101 million pounds spun in 1939, only 553 million (valued at 153 million dollars) were sold as yarn. The largest users of yarns for sale are knitting mills and weaving mills not equipped with spindles. The domestic yarns, almost all of which are ring spun, are predominantly of coarse and medium counts; less than 10 percent are finer than 40s. Exports are much larger than imports, but are nevertheless equivalent to only about three-tenths of 1 percent of domestic consumption. Exports in 1939 were equal to 1.8 percent and imports to 0.3 percent of the total production of yarn for sale.

The number of cotton-spinning spindles in place in the United States declined from the record height of 37.9 million on December 31, 1924, to 25.5 million on June 30, 1939, and to 23.1 million on December 31, 1944, and the downward trend is as yet unchecked. Active hours per spindle in place increased from 2,498 in 1925 to 3,644 in 1939 and to 5,577 in 1942. The longer hours of operation per spindle more than compensated for the decrease in number of spindles, with the result that the production of cotton yarn increased from about 2.5 billion pounds in 1925 to about 3.1 billion in 1939 and to a record of about 4.8 billion in 1942. After 1942 the shortage of labor necessitated curtailment of hours of operation, until in 1944 the active hours per spindle in place dropped to 4,940, and the total output of yarn to about 4.1 billion pounds.

United States imports of cotton yarn generally correspond to only about one-twentieth of 1 percent of the total quantity produced domestically, and to less than one-half of 1 percent of that portion

produced for sale only. Imports are mainly from the United Kingdom and predominantly of fine combed yarns mule-spun from long-staple Egyptian cotton. Whereas domestic cotton yarns average but little above 20s, imports in 1939 averaged 85s, and in 1941-44 averaged above 100s. As shown in the following table, imports in 1939 ranged from less than two one-hundredths of 1 percent of the coarse and medium yarns, 1s-40s, which constitute the bulk of domestic production, and two-tenths of 1 percent of medium fine yarns, 41s-80s, to about 2½ percent in fine yarns, 81s-120s, and to over 21 percent in fine yarns 121s and above. Extremely fine counts such as 200s and above, used in small amounts by the lace industry, are wholly imported.

United States production and imports of cotton yarn, by yarn number, for 1939, are given below:

Yarn number	Production	Imports	Ratio of imports to production
	<i>1,000 pounds</i>	<i>1,000 pounds</i>	<i>Percent</i>
1s-40s.....	2,907,827	427	0.015
41s-80s.....	175,948	348	.200
81s-120s.....	15,395	397	2.580
121s and above.....	2,000	424	21.720
Total or average.....	3,101,170	1,616	.090

Normally the main user of the foreign yarns is the domestic machine-lace industry. Imports during the war have been largely fine yarns for rayon-hosiery reinforcement purposes. The duty on plied yarns of 81s and above is 30 percent ad valorem.

In pounds of cotton yarn spun the United States ranks first; before the war it was followed by Japan, the Soviet Union, the United Kingdom, China, and India. During the war the largest producers have been the United States and India. The United Kingdom is the largest producer of fine and special yarns.

International trade in cotton yarn reached an all-time peak in 1913, about 750 million pounds; in 1939 it was about 375 million pounds. The main exporters in 1939 were the United Kingdom and Japan, followed by India, Belgium, and Italy.

POST-WAR SHORT TERM

For a period after the war the domestic and foreign demand for cloth and other manufactures of cotton will probably be so large that every spinning spindle in the United States can be run to capacity. The number of spindles available, however, will be 2-3 million less than in 1939, because of lack of replacements during the war when the textile-machinery firms were making munitions. Also, even if ample labor is available, it is doubtful if any large percentage of the mills will again attempt operation of the unpopular third shift. Under these circumstances the total domestic output of cotton yarn will probably not approach the peak attained during the war, and 4 billion pounds, about a third more than in 1939, is perhaps the most that can be expected.

With the domestic spindles more or less restricted to coarse and medium yarns needed to make fabrics in most urgent demand, it is probable that there will be a substantial increase in the small imports of fine yarns from the United Kingdom. These imports might amount to at least 5 million pounds, which would be three times the imports in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The demand for cotton yarn will be affected by increasing competition from yarns of other textile fibers, particularly rayon and other synthetics, and, for certain purposes, from nontextile materials such as paper. It seems probable that consumption will be slightly below that of 1939, say, between about 2,700 million and 3,100 million pounds.

Duty as in 1939.—Imports would probably approximate those in the decade before the war and range from 1-2 million pounds a year; assuming an increase of 25 percent in foreign costs and prices above those of 1939 the total foreign value may range from 1-2 million dollars.

Production for the domestic market may be estimated at 2,700-3,100 million pounds; assuming an increase of about a third in domestic costs and prices above those of 1939¹ the value may range from about 900-1,000 million dollars.

Duty reduced by 50 percent.—Such a reduced duty, ranging from less than 3 percent ad valorem on the coarsest yarns to 15 percent on the finest would probably result in a marked increase in the imports; they might increase to between 40 million and 60 million pounds, or between 1½ and 2 percent of total domestic consumption, and be equal to between 7 and 11 percent of the domestic yarns produced for sale. Imports would no longer be confined to fine and special yarns but would include considerable amounts of medium and coarse yarns similar to the bulk of domestic production. The average foreign value per pound would drop from that estimated (\$1 per pound) with the rate of duty unchanged, to a much lower value. It might be 32 cents a pound, or approximately the average value of domestic yarns. The total foreign value of imports would then be between 13 million and 19 million dollars.

Production for the domestic market would probably decrease by approximately the amount of the increase in imports and might range from 2,700-3,000 million pounds, valued at 800-900 million dollars.

Duty increased by 50 percent.—Such an increase would cause imports to be restricted even more sharply than heretofore to fine counts and specialties required in individual amounts so small that they afford no inducement to domestic spinners. Imports might be from 25 to 50 percent less in quantity than with an unchanged duty, and might range from 0.8-1.2 million pounds. Because of the concentration of imports on yarns of the highest quality, and the general increase in cotton and labor costs over those of 1939, there might be a sharp increase in the average unit value, possibly to about \$1.30 a pound, in which case the total foreign value might be only moderately less

¹ Cotton-yarn prices in general tend to rise and fall with raw-cotton prices. Cotton-yarn prices here stated or implied are based on the assumption that in the long-term period raw-cotton prices will be based on supply and demand without benefit of any Government price-support program.

than with an unchanged duty, ranging perhaps from 1-2 million dollars. This change in quantity of imports is so small in relation to consumption that it would have no appreciable effect on the quantity or value of production which would remain about the same as with the duty unchanged.

Per capita income 75 percent higher than in 1939.

The demand for all textiles would probably increase so much that in spite of the competition from other materials the consumption of cotton yarn might be 3,200-3,600 million pounds a year, or about 20 percent greater than with no change in income.

Duty as in 1939.—The increased demand for specialties and luxuries might cause imports to be at least three times as great in quantity and 3½ to 4 times as great in value as if income were unchanged. They would then be in the neighborhood of 5-million pounds, with a foreign value of 6 million dollars a year.

The quantity of production for the domestic market might be 3,200-3,600 million pounds a year, or about 20 percent greater than if income were unchanged. Upon the assumption that domestic costs and prices would be about 13 percent greater than those estimated at the lower level of income, the value of production would then be 1,200-1,300 million dollars a year.

Duty reduced by 50 percent.—Imports might be somewhere between 80 million and 120 million pounds. With the extension of the scope of imports to include large quantities of medium- and low-grade yarns similar to the domestic, the average foreign value might approximate that prevailing for domestic yarns. If this unit value should be 36 cents a pound, then the total foreign value of imports would be 29-43 million dollars.

Production for the domestic market would probably be about 3,100-3,500 million pounds, with a value of 1,100-1,200 million dollars.

Duty increased by 50 percent.—Imports might be only one-third the quantity estimated with duty unchanged but sell at much higher prices. They might be about 1-2 million pounds, with a foreign value from 2.5-3.5 million dollars. Production for the domestic market might remain about the same as with duty unchanged, or from 3,200-3,600 million pounds valued at 1,200-1,300 million dollars.

Exports

In the immediate post-war years there will probably be a very strong foreign demand for cotton yarn but domestic requirements may limit United States exports to about 20 million pounds a year. This quantity would be twice that exported in 1939, but less than that exported in 1941 or in various years before 1930. The principal markets would probably be found, as heretofore, in Latin America and Canada.

In the long-term period there appears to be little prospect that United States exports of cotton yarn will average above the 1939 level of about 10 million pounds, as they will be restricted by the competition of cheaper foreign yarns of cotton and of rayon.

Employment

Employment in 1939, when cotton-yarn production was about 3,100 million pounds, has been estimated at about 275,000 persons. Future production has been estimated herein, on various assumptions as to

income and duty, to range from 2,700–3,600 million pounds. Taking as a base the 1939 ratio of employees to production, the number of employees in the long-term period may range from about 240,000–320,000.

CROCHET, DARNING, AND EMBROIDERY COTTONS

Tariff paragraph: 902.

Commodity: Crochet, darning, embroidery, and knitting cottons for hand work.

Rate of duty: 20% to 35%.

Equivalent ad valorem (1939): 21%.

NOTE.—The rates of duty under the Tariff Act of 1930 are ¼ cent per 100 yards but not less than 20 percent nor more than 35 percent ad valorem. Imports are subject to additional duty of 10 cents per pound on the cotton contained therein having a staple of 1¼ inches or more in length, as provided for in paragraph 924. This additional duty is not included in computing the average ad valorem rate under paragraph 902.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	17,000	35	16,965	1,230	17,195	Percent
Value (\$1,000).....	16,400	27	16,373	1,302		2.2
Unit value (per pound).....	\$0.91	\$0.77	\$0.92	\$1.31		
Persons employed (number).....	(1)					

1 Estimated.

2 Foreign value.

3 Estimated 2,000–2,200.

“Cottons for hand work” are special cotton yarns put up in short lengths, usually in skeins or balls, or on cards, for darning, mending, knitting, crocheting, tatting, embroidering, and general art needlework. Total United States production of cotton thread and cottons for hand work increased steadily during the decade ended 1939; this increase was accompanied by a decrease in unit values. In recent years imports have constituted only a small part of domestic consumption. Ordinarily more than three-fourths of these cottons have been imported from France and have competed principally on the basis of quality and reputation.

The demand for hand-work cottons depends somewhat on prevailing fashions and the popularity of the hand-knitting arts. In response to efforts by manufacturers to stimulate use of such cottons, production increased after 1921 to an estimated 7 million pounds in 1939. In the 10-year period 1930–39, imports averaged about 776 million yards (about 231,000 pounds), with a high of 976 million yards (290,000 pounds) in 1930 and a low of 644 million yards (192,000 pounds) in 1935.

POST-WAR SHORT TERM

In the immediate post-war period, consumption of hand-work cottons will probably be supplied almost entirely by domestic production. During the war, United States production appears to have increased

sufficiently to supply the home market and to permit an increase in exports. Immediately after the war, imports will probably be less than in 1939. The principal pre-war sources were the mills in the Alsace region of France and these may have suffered materially during the war. If they did, it is doubtful that they would be able to achieve an early recovery.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Assuming no great changes in fashion, consumption will probably be not much greater than it was in 1939, the effects of increased population being offset to some extent by the increased use of yarns made from synthetic fibers. Consumption might be about 7½ million pounds and production for the domestic market about 7 million pounds, valued at about 7 million dollars. An increase of 10 percent in the domestic unit price is assumed, because of an expected rise in the price of cotton. Changes of 50 percent in the rates of duty would probably affect both consumption and production slightly, but the effect would be too small to warrant separate estimates under the several duty assumptions, particularly since imports constitute a small proportion of total consumption.

Duty as in 1939.—Imports might be about 10 percent higher than in 1939 and amount to about 250,000 pounds, valued at about \$375,000.

Duty reduced by 50 percent.—Imports would perhaps be 10–15 percent higher than with no change in duty and amount to about 300,000 pounds, with a foreign value of about \$450,000.

Duty increased by 50 percent.—Imports would probably be somewhat smaller than with no change in duty, and would probably amount to about 200,000 pounds, with a foreign value of \$300,000.

Per capita income 75 percent higher than in 1939.

With the higher level of income, consumption might increase to 8.3 million pounds, about 15 percent more than with income as in 1939. Prices would probably be 10–15 percent higher than with income as in 1939. Production for the domestic market would probably be about 8 million pounds, valued at about 8.5 million dollars. Changes in the duties by 50 percent would probably affect both consumption and production slightly.

Duty as in 1939.—Because of the possible increased demand for hand-work cottons, particularly for high quality yarns, imports might amount to about 300,000 pounds, with a foreign value of about \$480,000.

Duty reduced by 50 percent.—Imports might amount to about 400,000 pounds, with a foreign value of about \$650,000.

Duty increased by 50 percent.—Under these conditions, imports would probably be a little smaller than with the duty as in 1939. They might amount to about 250,000 pounds, with a foreign value of about \$400,000.

Exports

In the period 1931–40 exports were small, the annual average amounting to 28,360 pounds, valued at \$25,770. During the war years 1941–43, exports increased to an annual average of about 218,000

pounds, valued at about \$260,000. This increase appears to have resulted principally from the inability of foreign manufacturers to supply their former markets. In the post-war long-term period, foreign producers will probably reenter their former markets. United States exports no doubt will decline from the levels reached during the war, but possibly not to as low a level as existed before the war.

Employment

Cottons for hand work are produced by mills which manufacture sewing thread. The total number of persons employed by the cotton-thread industry in 1939 was reported as 13,300, of which about 15 percent (2,000-2,200) might represent the number employed in the production of crochet, darning, and embroidery cottons. Under the smallest domestic production estimated above, employment would be about at this level; at the maximum, it would be about 15 percent higher. Changes in style and greater activity in the hand-knitting or crocheting arts tend to affect domestic production to a greater degree than any probable changes in imports, whether arising from tariff changes or otherwise.

COUNTABLE COTTON CLOTH

Tariff paragraphs: 904 and 905.

Commodity: Countable cotton cloths (including those containing silk and rayon, or other synthetic textile) and cotton tire fabrics.

Rates of duty: 7½% to 57½% ad val. *Average ad valorem (1939):* 31%.

NOTE.—Subject to additional duty of 10 cents per pound on cotton, contained in cotton cloth, having a staple of 1¼ inches or more in length, as provided for in paragraph 924. This additional duty is not included in computing the equivalent ad valorem rate. See text for tariff history since 1930.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity:						<i>Percent</i>
(million square yards).....	8,485	367	8,118	111.8	8,230	1.4
(million pounds).....	2,219	1100	2,119	19.5	2,139	.9
Value (million dollars).....	1,640	38.5	1,608	8.7		
Unit value:						
(per square yard).....	\$0.08	\$0.10	\$0.08	\$0.08		
(per pound).....	.29	.37	.29	.44		
Persons employed (number).....	13,300,000					

¹ Estimated.

² Foreign value.

"Countable cotton cloths" is a term used to designate all kinds of cotton cloths which, if imported, would be dutiable under tariff paragraphs 904 and 905 at progressive rates of duty based on the average yarn number, in the ascertainment of which the threads have to be

counted. (Paragraph 904 also includes cotton tire fabric at a fixed rate of duty.) Excluded from the scope of paragraphs 904 and 905, because mentioned *eo nomine* in other tariff paragraphs, are table damask, tapestries, and pile fabrics, also articles such as sheets, blankets, quilts, and towels. All of the foregoing, in addition to countable cotton cloths, are included as piece goods in census reports under the heading "Cotton woven goods over 12 inches in width," of which the 1939 production was recorded as 9,045 million square yards (2,479 million pounds) valued at 722 million dollars. Countable cotton cloths (8,485 million square yards in 1939) therefore constitute more than 90 percent of the total cotton woven goods produced in the United States.

In the Tariff Act of 1930, the duties on countable cotton cloths ranged from 10.35 percent to 62½ percent *ad valorem*, depending on the fineness of the yarn, and to a less degree on the weave and finish. On bleached cloth, plain-woven and of medium yarns (31s to 50s), the duty was 23.85 to 30.50 percent *ad valorem*. Most of the imports from Japan were in this classification. The higher rates applied principally to specialties and cloth woven from fine yarns, imported almost exclusively from the United Kingdom and other European countries.

In 1936, following a substantial increase in the imports from Japan the rates of duty on most cotton cloth of medium yarns (31s to 50s) were increased about 42 percent. The duty on bleached cloth, plain-woven, and of the specified yarn numbers, then became 34 percent to 43½ percent *ad valorem*. The duties on cotton cloth were reduced somewhat in trade agreements with Switzerland (1936) and the United Kingdom (1939). These reductions, however, were largely confined to specialties or (in the trade agreement with the United Kingdom) to cloth above certain stated values per pound. They did not apply to the medium- and low-priced fabrics which constituted the bulk of the imports from Japan, and upon which, in 1936, the duties were increased.

United States imports of countable cotton cloths (and cotton tire fabrics) amounted, in millions of square yards, to more than 206 in 1923 (the record import), to 28 in 1932, and to 147 in 1937; they were 112 in 1939. Before 1931 the United Kingdom predominated in this trade, supplying mostly high-quality fabrics made of fine mule-spun yarns and some coarser-yarn specialties. In 1931-34 Switzerland was the principal source, supplying mostly fine lawns and organdies. In 1935-41 Japan predominated, shipping mulls and shirtings which were similar to the domestic printcloths but somewhat lighter because they were made of slightly finer yarns. The fine goods and specialties from Europe in general were sold at higher prices than the most nearly comparable domestic product. The lower-grade cloths from Japan, however, were generally sold at prices below the most nearly comparable domestic product, and were directly competitive with a substantial segment of domestic production. The following table gives imports from Japan and from other countries in 1937-39, together with the *ad valorem* equivalent of the duties:

TABLE 1.—*Countable cotton cloth (par. 904): United States imports for consumption from Japan and other countries, 1937-39*

Country	1937	1938	1939
Quantity (1,000 square yards):			
Japan.....	106,214	33,553	81,621
Other countries.....	37,676	22,170	28,306
Total.....	143,890	55,723	109,927
Value (1,000 dollars):			
Japan.....	5,492	1,669	3,009
Other countries.....	7,535	4,300	5,311
Total.....	13,027	6,069	8,320
Unit value (per square yard):			
Japan.....	\$0.052	\$0.050	\$0.037
Other countries.....	.200	.198	.188
Average.....	.091	.109	.076
Ad valorem equivalent of duty (percent):			
Japan.....	31.4	33.7	30.7
Other countries.....	33.5	33.1	30.2
Average.....	32.6	33.3	30.4

Source: Compiled from official statistics of the U. S. Department of Commerce.

United States exports of cotton cloth have been much larger than the imports. At the peak, in 1920, they were 819 million square yards. They declined to 465 million in 1923 and 186 million in 1935, but later recovered in great part, amounting to 367 million in 1939 and 448 million in 1942. The principal markets for United States exports before the war were found in the Philippine Islands, Cuba, and Canada.

United States production of countable cotton cloths (and cotton tire fabrics) of the kinds dutiable under paragraphs 904 and 905 amounted, in millions of square yards, to 7,704 in 1923, to 6,651 in 1931, to 8,954 in 1937, and to 8,485 in 1939. The bulk of the domestic cloths are made of coarse and medium yarns, virtually all ring-spun; less than 10 percent are made of yarns finer than 40s.

During the war, total imports were reduced to a small fraction of their former proportions; production of countable cotton cloth in the United States (much of which was required for military purposes) increased one-third, to a peak of about 11 billion square yards in 1942, and the average price of cotton cloth approximately doubled. An important part of the increase in the price of cotton cloth resulted from the advance in the price of raw cotton, the base grade, $\frac{1}{16}$ -inch middling, at the mill increasing from approximately 10 cents a pound in 1939 to 22 cents in 1943-44. Any part of this increase in price which continues after the war will either be borne alike by manufacturers abroad and in the United States, or (if the existing subsidy on exports of raw cotton continues) it will be offset by subsidies on exports and restrictions or compensatory charges on imports of cotton cloth, for which there is already authority under existing legislation.

The demand for cotton cloth is affected by the increasing competition from cloth made of other textile fibers, particularly rayon, and also, for certain purposes, from nontextile materials such as paper. In the years preceding the war, increasing amounts of machinery in

cotton mills here and abroad were being devoted to spinning and weaving rayon staple fiber and this trend has been accentuated during the war, particularly in the Axis and Axis-controlled countries which were unable to obtain sufficient cotton. Continuation even of the pre-war trend would tend to reduce world production and trade in cotton cloth.

In the estimates which follow, it has been assumed that in the long run the cotton manufacturing industry in foreign countries will be restored, and that they will be able to compete in the United States market on the same terms as before (apart from changes in duty). Because of uncertainty as to the validity of this assumption with regard to Japan, the estimated imports from that country are stated separately.

POST-WAR SHORT TERM

An active demand for cotton cloth is anticipated because of the expected high level of consumer buying power, the need to re-outfit men and women who have been in uniform, and the need to replace distributors' stocks which have become depleted. The combined requirements probably will be sufficient to maintain production near its present high level for 2 or 3 years after the war.

During the war, the world supply of cotton cloth has been reduced, and the reduction has been particularly severe in Japan and the European countries which were once the principal exporters. It will probably be several years after the war before the customary supplies abroad can be restored. Until this has taken place, imports into the United States will probably be only a small fraction of the quantity received in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The total consumption of countable cotton cloth would probably remain close to the level (3,200 million square yards or 2,100 million pounds) in 1939, the exact amount being influenced somewhat, although not to a great extent, by the assumption as to duty. Any increase in consumption that might have resulted from the increase of population and from new industrial uses would probably be offset by the greater competition of rayon and other artificial fiber.² Production would probably range from 8,000-8,600 million square yards (2,200-2,350 million pounds), depending both on the volume of exports and the volume of imports.

Because the price of cotton cloth in 1939 was comparatively low, and because it increased approximately 100 percent between 1939 and 1943, it is probable that the price will be greater than in 1939. For the purpose of the estimates that follow, an average price 33 percent greater is assumed, or 39 cents a pound (10½ cents a square yard) for cotton cloth, of which 15 cents is taken to represent the cost of cotton in the cloth (based on a raw cotton price of 13 cents a pound, plus waste) and 24 cents, the manufacturing and selling costs. A slight variation in the price is allowed for changes in the duty. Under

² A considerable amount of rayon, in the form of staple fiber, will be run on cotton spindles and looms. Although fabrics in chief value of staple fiber are excluded from the production statistics of cotton cloth, their manufacture by cotton mills is reflected in the activity of the cotton-manufacturing industry. The quantity of such fabrics manufactured in cotton mills is expected to increase substantially by 1943, and may represent from 10 to 15 percent of the output of cotton mills.

these circumstances, the value of total production might be from 800–950 million dollars a year, varying somewhat according to duty assumptions, or 25–45 percent greater than in 1939 and the value of production for the domestic market, 775–875 million dollars. Unit prices of imports are estimated to increase about the same percent over 1939 as the domestic (33). Imports from Japan may average about 30 cents a pound (5 cents a square yard) and those from Europe about \$1.25 a pound (25 cents a square yard).

Duty as in 1939.—Imports might approximate those in 1937, which were slightly more than 1½ percent of the consumption of cotton cloth in the United States. Imports from Japan would then amount to 100–125 million square yards with a foreign value of 5–6 million dollars, and those from other sources would amount to 30–40 million square yards, with a foreign value of 7–10 million dollars.

Duty reduced by 50 percent.—The duty on print cloth of the type imported from Japan would be 29 percent below the level existing before the Presidential proclamation by which it was increased in 1936. The imports from Japan, consisting chiefly of print cloth, but including sheeting and other fabrics produced on a large scale, might range between 200 million and 400 million square yards, with a foreign value of 10–20 million dollars a year. Imports from Europe, it is believed, would consist chiefly (as before) of specialties and goods woven from fine yarns. The sale of these fabrics might be increased somewhat by the reduction in landed cost (amounting possibly to 10–15 percent) that would result from the reduction of the duty. Imports from Europe might be 40–60 million square yards, having a foreign value of 10–15 million dollars a year. Total imports then would be 3 to 5½ percent of consumption in the United States, or 250–450 million square yards, with a foreign value of 20–35 million dollars a year.

Duty increased by 50 percent.—As the duty was previously increased in 1936 on fabrics resembling those produced in this country on a large scale, the return to foreign manufacturers of such fabrics (particularly in Japan) would be considerably less than the average from sales on this market during the period 1930 to 1940, and the imports, in all likelihood, would be small. They might be 30 to 50 percent less than in 1939, or from 40–60 million square yards, having a foreign value of 2–3 million dollars a year. The effect of a 50-percent increase in the duty on imports (from Europe) of specialties and goods woven from fine yarns would be less marked, chiefly because comparable fabrics, in many instances, would not be obtainable in this country, without a very much greater increase in the domestic price than would be caused by this change in duty. The imports from Europe might be reduced, possibly, to 20–25 million square yards, with a foreign value of 5–6 million dollars a year. Total imports then would be about 1 percent of consumption in the United States, or 60–85 million square yards, with a foreign value of 7–9 million dollars a year.

Per capita income 75 percent higher than in 1939.

The consumption of countable cotton cloth in the United States would be large in spite of the greater proportionate increase in the consumption of rayon. It might be near the recent wartime peak, or, say, 10,000 million square yards a year, the exact amount being influenced somewhat, although not to a great extent, by the duty. The annual production might be 9,650–10,350 million square yards (2,600–2,800 million pounds) depending on the volume of exports and imports. In

addition to cotton fabric produced, the cotton mills would probably manufacture a considerable quantity of fabric from rayon staple, possibly as much as 300 million pounds. The combined output as thus estimated is greater than could be produced, under peacetime operating conditions, with existing cotton-manufacturing equipment.

Both as the result of higher prices and higher average quality, the unit value of cotton cloth produced would probably be greater than if per capita income had remained as in 1939. An average value 50 percent greater than in 1939, or 45 cents a pound, is assumed, of which 16 cents is taken to represent the cost of cotton in the cloth (based on a raw-cotton price of 14 cents a pound, plus waste). A slight variation in the price might occur with changes in the duty. The total value of production then might be 1,160-1,350 million dollars a year, of which 1,125-1,250 million would be for the domestic market. It is assumed that the average value of imports, as of production, would be about 50 percent greater than in 1939. Imports from Japan would then average about 36 cents a pound (6 cents a square yard) and those from Europe about \$1.50 a pound (30 cents a square yard).

Duty as in 1939.—The imports from Japan of staple goods might be 120-160 million square yards, with a foreign value of 7-10 million dollars a year. Imports of specialties and fine-yarn goods from Europe would be large, because of the greatly increased demand for luxuries. They might be from 60-80 million square yards, with a foreign value of from 17-25 million dollars. Total imports then would be about 2 percent of consumption in the United States, or 180-240 million square yards, with a foreign value of 24-35 million dollars a year.

Duty reduced by 50 percent.—A further increase in imports of fabrics received from Japan undoubtedly would occur, although there is no basis on which to estimate its extent. The amount might be between 250 million and 500 million square yards, with a foreign value of from 15-30 million dollars a year. Imports would be limited both by the quantity which Japan was capable of supplying (the entire exports of that country in 1939 were about 2.5 billion square yards), and the quantity which could be absorbed here without a material reduction in the price (a reduction of 14 percent in the United States price, for example, would operate to prevent any increase in the imports of print cloth and similar fabrics as a result of the reduction in duty). The imports of fabrics received from Europe would probably be moderately greater than if there had been no change in the duty, and might be 80-120 million square yards, having a foreign value of 24-36 million dollars a year. Total imports then would be 3½ to 6 percent of consumption, or 330-620 million square yards, with a foreign value of 39-66 million dollars a year.

Duty increased by 50 percent.—The imports of fabrics received from Japan would be considerably less than if the duty had remained the same or been reduced. They might amount to 50-70 million square yards, with a foreign value of 3-4 million dollars a year. Imports from Europe might amount to 30-50 million square yards, with a foreign value of 10-15 million dollars a year. Total imports then would be about 1 percent of consumption, or 80-120 million square yards, with a foreign value of 13-19 million dollars a year.

Summary of estimates.

The foregoing estimates are summarized in tables 1 and 2.

TABLE 2. Countable cotton cloth: Estimated post-war consumption, imports from Japan and other countries, and production under the assumptions of Senate Resolution 341

[Quantity in millions of square yards]

Period, income level, and tariff treatment	Consumption (quantity)	Imports from Japan		Imports from other countries		Production ¹ (quantity)
		Quantity	Percent of consumption	Quantity	Percent of consumption	
1939 (actual).....	8,230	82		30		8,485
Post-war long term:						
Per capita income same as in 1939:						
Duties as in 1939.....	8,000-8,400	100-125	1.2-1.5	30-40	0.4-0.5	8,200-8,550
Duties reduced by 50 percent.....	8,000-8,400	200-400	2.4-4.9	40-60	.5-.7	8,000-8,350
Duties increased by 50 percent.....	8,000-8,400	40-60	.5-.7	20-25	.2-.3	8,200-8,600
Per capita income 75 percent higher than in 1939:						
Duties as in 1939.....	9,800-10,200	120-180	1.2-1.6	60-80	.6-.8	9,900-10,250
Duties reduced by 50 percent.....	9,800-10,200	250-500	2.5-5.0	80-120	.8-1.2	9,650-10,000
Duties increased by 50 percent.....	9,800-10,200	50-70	.5-.7	30-50	.3-.5	10,050-10,350

¹ Includes production for export (367 million square yards in 1939), assumed to be 320 million square yards with income the same as in 1939, and 290 million square yards with income 75 percent higher than in 1939.

TABLE 3.—Countable cotton cloth: Summary of estimated post-war production and imports from Japan and other countries, under the assumptions of Senate Resolution 341

Period, income level, and tariff treatment	Production			Imports from Japan			Imports from other countries		
	Quantity	Price per square yard	Value	Quantity	Price per square yard	Value	Quantity	Price per square yard	Value
1939 (actual).....	Million sq. yd. 8,485	\$0.08	Million dollars 640	Million sq. yd. 82	\$0.04	Million dollars 3	Million sq. yd. 30	\$0.20	Million dollars 6
Post-war long term:									
Income same as in 1939:									
Same duties as in 1939.....	8,200-8,550	.10½	860-900	100-125	.06	5-6	30-40	.25	7-10
Duties reduced by 50%.....	8,000-8,350	.10	800-835	200-400	.05	10-20	40-60	.25	10-15
Duties increased by 50%.....	8,300-8,600	.11	915-950	40-60	.06	2-3	20-35	.25	5-6
Income 75% higher than 1939:									
Same duties as in 1939.....	9,900-10,250	.12½	1,240-1,280	120-180	.06	7-10	60-80	.30	17-25
Duties reduced by 50%.....	9,650-10,000	.12	1,160-1,200	250-500	.06	15-30	80-120	.30	24-36
Duties increased by 50%.....	10,050-10,350	.13	1,310-1,350	50-70	.06	3-4	30-50	.30	10-15

Exports

Exports are generally from 2 to 5 percent of production, and have been chiefly to the Philippine Islands, Cuba, and the countries of North and South America. Exports have increased during the war, and they will probably continue large for several years after the war is over. On a long-term basis, however, they are expected to be less than before the war, because of higher costs in the United States, and the probable expansion and modernization of the industry abroad. If the tariff preferences heretofore granted to American products in the Philippines are terminated, exports of cotton cloth will be even less.

Employment

The number of persons employed in the cotton broad-woven goods industry¹ increased from 312,000 in 1939 to an estimated 400,000 in 1942. If per capita income returns to the same level as in 1939, the number of employees will probably again become about the same as in that year. If per capita income is increased 75 percent, the high level of wartime employment may be maintained, or even extended slightly because of the larger labor force that will be required if the increase in working hours during the war (amounting to approximately 10 percent) is removed.

Employment would be affected by changes in the duty and the resulting changes in imports, particularly if large imports were received from Japan. Based on the various estimates made as to the quantity of imports, and assuming that imports displace a corresponding quantity of production, a reduction of 50 percent in the duty might reduce employment 2 or 3 percent, and an increase of 50 percent in the duty might increase employment about 1 percent.

TRACING CLOTH

Tariff paragraph: 907.

Commodity: Tracing cloth.

Rate of duty: 20% ad val.

NOTE.—The rate fixed in the Tariff Act of 1930 was 20 percent ad valorem, which was reduced to 20 percent effective January 1, 1939, pursuant to trade agreement with the United Kingdom. Imports are subject to additional duty of 10 cents a pound on the cotton contained therein having a staple of 1 $\frac{1}{4}$ inches or more in length, as provided for in paragraph 924.

GENERAL

¹ Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
				<i>Percent</i>
Quantity (1,000 sq. yds.).....	2,000	1,363	3,363	41
Value (\$1,000).....	1,500	708		
Unit value (per sq. yd.).....	\$0.75	\$0.52		
Persons employed (number).....	300			

¹ No exports reported.

² Estimated.

³ Foreign value.

¹ The Bureau of the Census reported the number of employees in the total cotton-goods industry in 1939 as follows: Cotton broad-woven goods, 312,249; cotton yarn, 70,452; cotton narrow fabrics, 13,318; and cotton thread, 13,298.

Tracing cloth is a smooth semitransparent fabric made from plain-woven fine-yarn cotton cloth by filling and coating; it is glazed on one side but dull-finished on the other so as to take ink without blurring. It is used by draftsmen, architects, and engineers in duplicating drawings. The tracing cloth is placed in contact with the drawing and the lines traced on the cloth with drawing ink; the cloth with the tracing on it is then put over blueprint paper and exposed to sunlight, or to high-power artificial light, in order to secure blueprint reproductions. Specially prepared tracing paper, although not so durable as tracing cloth, is largely used as a cheaper substitute.

Imports of tracing cloth in the 1910-29 period were remarkably steady at about 2½ million square yards a year; imports in subsequent years, although fluctuating, have averaged about half of this amount. About three-fourths of the imports have come from England, and most of the remainder from Germany. The decrease in imports since 1929 has been due to the development of this industry in the United States.

After two unsuccessful attempts to produce high-grade tracing cloth in the United States, a satisfactory quality was finally produced by a firm which was established in 1922 as a subsidiary of the principal British producer and later incorporated as an American company. Its output, small for several years, increased after 1929 to a point where a sharp curtailment in imports resulted; the output of this concern in the years immediately preceding World War II accounted for nearly 90 percent of United States production. In the 1930's two cloth-finishing companies added tracing cloth to their list of products, but as late as 1939 there were only 3 producers; consequently domestic production has never been disclosed in census reports. During World War II the leading domestic company greatly increased its output; several other firms also entered the field. It is possible that after the war the proportion of imports of tracing cloth to consumption may decline.

POST-WAR SHORT TERM

The post-war demand for tracing materials is expected to be large, because of the high level of building construction, reconversion activities, and the output of new or improved industrial products. The demand for tracing cloth, in spite of the competition of improved tracing paper, will probably be much larger than in pre-war years. Domestic production, which has more than doubled during the war, could meet all requirements. Because of the anticipated need of tracing cloth in Europe imports may be small.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Per capita consumption of tracing cloth would probably be the same as in 1939. Taking account of population increase, total consumption might be 10 percent higher than in that year, totaling about 3.7 million square yards. A 50-percent change in the rate of duty would probably not affect consumption sufficiently to warrant separate

estimates for the various duty levels. Both domestic and foreign unit values might be 20 percent higher than in 1939 because of anticipated higher prices for cotton fabrics.

Duty as in 1939.—Imports may be about 1 million square yards, with a foreign value of \$625,000. Production may be 2.7 million square yards, valued at about 2.4 million dollars.

Duty reduced by 50 percent.—With duty reduced to 10 percent ad valorem, imports would probably be somewhat higher, and might be about 1.3 million square yards, valued at about \$810,000 (foreign value). Production would then be about 2.4 million square yards, valued at about 2.2 million dollars.

Duty increased by 50 percent.—With the duty at 30 percent ad valorem, imports might be 800,000 square yards, valued at \$500,000 (foreign value). Production might be 2.9 million square yards, valued at about 2.6 million dollars.

Per capita income 75 percent higher than in 1939.

With such a per capita income, a marked increase would be likely to occur in building construction, in the output of industrial machinery and durable goods, and in other activities requiring tracing materials. Tracing cloth is used, in preference to tracing paper, in the tracings to be filed for an indefinite period and would therefore not reflect a boom in the building of residences and other dwellings so much as in the construction of factories, office buildings, and ships. Total consumption might be 50 percent larger than that with income as in 1939 and might total about 5.5 million square yards. The unit prices might be 10–15 percent higher than with an unchanged income.

Duty as in 1939.—Imports might be 50 percent greater in quantity than with income as in 1939, or nearly 1.5 million square yards, with a foreign value of about 1.1 million dollars. Production might then be about 4 million square yards, valued at about 4 million dollars.

Duty reduced by 50 percent.—Imports would probably be about 1.9 million square yards, valued at about 1.3 million dollars (foreign value). Production might be 3.6 million square yards, valued at about 3.6 million dollars.

Duty increased by 50 percent.—Imports might be about 1.2 million square yards, valued at about \$840,000 (foreign value). Production might be about 4.3 million square yards, valued at about 4.3 million dollars.

Exports

United States exports of tracing cloth are not separately reported, but are known to be small.

Employment

The number of persons employed in the production of tracing cloth in 1939 is estimated to have been 300. With exception of the principal firm, the producers also make various coated and filled fabrics, such as book cloths, window hollands, etc. On the basis of the above estimates of production, employment in the long-term post-war period may range between 400 and 500 persons, depending upon the level of duty and national income.

COTTON TAPESTRIES

Tariff paragraph: 908.

Commodity: Tapestries and other Jacquard-figured upholstery cloths wholly or in chief value of cotton or other vegetable fiber.

Rate of duty: 55% ad val.

NOTE.—Subject to additional duty of 10 cents per pound on cotton contained therein having a staple of 1½ inches or more in length, as provided for in paragraph 924.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 square yards).....	6,617	1,330	5,287	(1)		<i>Percent</i>
Value (\$1,000).....	\$ 2,000	430	\$ 1,570	\$ 1,760	\$ 3,330	53
Unit value (per square yard).....	\$0.30	\$0.32	\$0.30	(1)		
Persons employed (number).....	\$ 1,600					

¹ Not available.

² Estimated.

³ Landed value; foreign value was \$1,100,000.

Jacquard-woven fabrics for upholstery purposes usually have patterns of much larger size and more elaborate character than those in Jacquard-woven fabrics for dress use. The majority are heavy furniture-covering fabrics such as tapestries, brocades, brocatelles, and damasks, but some are light-weight curtain fabrics such as madras muslin. Tapestries, the most distinctive of the heavy fabrics, are yarn-dyed cloths woven with two or three warps and fillings. Mills making Jacquard-woven upholstery fabrics use a wide range of yarns, including single and ply yarns of various counts and colors and materials. For this reason most of these mills purchase their yarns.

The production of tapestries and similar Jacquard-figured upholstery cloths involves a high percentage of labor costs and does not lend itself to mass production. These cloths are mostly 50 or more inches wide and are woven with yarns of various sizes and colors, and in many cases of various materials, in intricate patterns. Innumerable designs are created each season to meet the demand for variety, and in many cases comparatively short lengths, 50 yards or less, are produced of a particular design.

The demand for tapestries and other Jacquard-figured upholstery fabrics is dependent on fashion. Domestic mills had their most prosperous period following the First World War, but the upholstery trade later turned to simpler and less elaborate cloths, such as printed and dyed fabrics, and the production of tapestries and similar Jacquard-figured fabrics declined sharply. The value of production in the peak year, 1923, was 21 million dollars. In subsequent years it decreased steadily until in 1939 the estimated value was about 2 million dollars.

United States imports of tapestries and other Jacquard-figured upholstery cloths have generally consisted of fabrics designed for sale

in this country at prices considerably above the average for domestic production. Imports attained a record value of about 5.5 million dollars in 1927, and then decreased to \$768,000 in 1932; the value was 1.1 million dollars in 1939, but during the war imports have declined to negligible amounts. Pre-war imports were mostly from Italy, followed by Belgium and France.

In the estimates which follow, it is assumed that the cloths here under consideration will retain, but not increase, the share of the market for upholstery materials which they possessed in 1939. As the demand for these cloths, however, is susceptible to changes in fashion, the estimates are subject to a considerable margin of error.

United States exports of tapestries and other Jacquard-figured upholstery cloths had an average value from 1922 to 1939 of about \$157,000, and ranged from \$25,000 in 1932 to \$430,000 in 1939; the 1940-44 average was about 1.7 million dollars. Canada has been the principal market in almost every year and this outlet for surplus goods has been of considerable importance to the domestic industry during the last decade.

POST-WAR SHORT TERM

It appears likely that, with large purchasing power available for use in the building and furnishing of new homes, a demand very much greater than in 1939 will develop for tapestries and other Jacquard-figured upholstery fabrics. It seems likely, however, that imports, which came principally from the continental countries, will be smaller than in 1939, as those countries (insofar as their industries can resume production on a sufficient scale) will be occupied to a large degree in meeting the demand at home.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—Per capita consumption might be about the same in quantity as in 1939, but as the average price of all cotton cloths in that year was comparatively low and increased greatly (approximately 100 percent) between 1939 and 1944, the price would probably be considerably higher than in 1939. An increase of 33 percent in unit prices is assumed for production, imports, and exports. Allowing for increased population, production for the domestic market might be 2.2 million dollars a year, and the landed value of imports 2.6 million a year (foreign value 1.6 million), making the total value of consumption about 4.8 million. Exports would presumably remain about the same in quantity as in 1939, but as the result of higher prices they might increase in value to about \$570,000 a year. The total value of production then would be 2.8 million dollars a year.

Duty reduced by 50 percent.—Imports might be 80 percent greater in quantity than with no change in duty. They would probably include a larger percentage of low- and medium-grade goods and therefore have an average unit value 10 percent less than that estimated with duty unchanged. They would then have a total landed value of about 3.4 million dollars (foreign value 2.6 million), or 30 percent more than with duties as in 1939. The average unit prices of domestic production would probably be reduced about as much as those of

imports, and the lower prices would operate to increase both consumption and exports, so that the increase in imports would not be accompanied by an equal decline in production. The value of production for the domestic market might be about \$950,000 a year. Exports might be a third greater than were estimated with no change in duty, and be about \$750,000 a year. Total production would then be about 1.7 million dollars, or about a third less than the value estimated on the basis of unchanged duties.

Duty increased by 50 percent.—Imports might decrease to about 45 percent of the quantity imported with no change in duty, but the restriction of imports to high-grade specialties would probably result in the average unit value being 10 percent higher than that estimated with duty unchanged. Total landed value would then be about 1.5 million dollars (foreign value \$800,000). Unit prices of domestic goods might increase to about the same extent as those of imports. The higher level of prices would operate to restrict both consumption and exports, so that production would probably not increase by as much as the reduction in imports. The value of production for the domestic market might be about 3.4 million dollars a year. Exports might be two-thirds as large as those estimated on the basis of unchanged duties, and amount to about \$400,000 a year. The total value of production would then be about one-third greater than if the duty had been unchanged, or in the neighborhood of 3.8 million dollars a year.

Per capita income 75 percent higher than in 1939.

As the result of a considerably expanded market for upholstered furniture, the consumption of cotton tapestries and other Jacquard-figured upholstery cloths might increase about 70 percent in quantity over that with an unchanged income. It is assumed that this increase would be shared proportionately by production and imports. In addition to the increase in quantity, an increase in price might be expected. For the purpose of the estimates that follow, average prices about 10–15 percent greater than those previously estimated on the basis of the same per capita income as in 1939 are assumed. Exports would participate in the increase in price, and might be somewhat greater in quantity than at the lower income level.

The estimates which follow are obtained by applying the foregoing assumptions to the estimates previously made for per capita income at the 1939 level.

Duty as in 1939.—Imports might be 2.5–3.5 million dollars a year (foreign value); equal to 4.0–5.6 million dollars landed value. The value of production for the domestic market would probably be 4.4 million dollars a year. Exports might be \$700,000 a year, in which case total production would be 5.1 million dollars.

Duty reduced by 50 percent.—Imports might be 4–6 million dollars a year (foreign value), equal to 5.3–8.0 million dollars landed value. Production for the domestic market would possibly decline to about 2½ million dollars a year. Exports might be 1 million dollars a year, in which case total production would be 3¼ million dollars.

Duty increased by 50 percent.—Imports might be reduced to about 1.5 million dollars a year (foreign value), equal to 2.8 million dollars landed value. Production for the domestic market would possibly increase to 6.3 million dollars. Exports might be \$500,000, in which case total production would be 6.8 million dollars.

Exports

Until production abroad has been restored, exports (as during the war) will probably be limited only by the quantity available. Thereafter, they might range from \$300,000 to \$1,000,000, depending on the relationship between domestic and foreign prices, and to some extent on the level of income in foreign countries. The comparative prices would be different under the different combinations of income and duty levels. The exports under each of the combinations have already been discussed separately.

Employment

It is estimated that about 1,500 operatives were employed in the production of cotton tapestries and other Jacquard-figured upholstery cloths in 1939. After the war the number might be 1,600-1,700 if per capita income is not increased, and 2,300-2,500 if per capita income is 75 percent greater than in 1939. A reduction of 50 percent in the duties might cause employment to be 30 or 40 percent less, and an increase of 50 percent in the duties might cause it to be about 20 percent more than it would be if duties were not changed.

COTTON VELVETEENS

Tariff paragraph: 909.

Commodity: Cotton velveteens,
plain-back, and twill-
back.

Rates of duty: 31¼%, 37½%, and 44%. Average ad valorem (1939): 32%.

NOTE.—The rate fixed in the Tariff Act of 1930 on all plain-back and twill-back velveteens was 62¼ percent ad valorem. By Presidential proclamation under section 336 of the tariff act the rate was reduced, effective July 24, 1933, to 31¼ percent on the plain-back, and to 44 percent on the twill-back. The rate on twill-back velveteens valued at 65 cents or more per square yard was further reduced to 37½ percent, effective January 1, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 sq. yds.).....	5,201	90	5,111	1,691	6,802	Percent 25
Value (\$1,000).....	¹ 2,600	¹ 65	¹ 2,535	² 253		
Unit value (per sq. yd.).....	¹ \$0.50	¹ \$0.72	¹ \$0.50	\$0.15		
Persons employed (number).....	(³)					

¹ Estimated.

² Foreign value.

³ Estimated 600 to 1,000.

Cotton velveteens are filling-pile fabrics in which part of the filling is cut to form a pile which spreads uniformly over the entire surface of the fabric. Velveteens may be divided into two groups: Plain-back and twill-back. Plain-back velveteen is used chiefly to make the cheaper types of blouses, dresses, and skirts; it is used also in the production of picture frames and jewelry boxes. Twill-back, the more durable and expensive of the two types of fabrics, is used almost exclusively in the garment trade. The domestic industry is

a comparatively small, but a highly specialized, part of the cotton-textile industry.

Before 1934, imports consisted mainly of the comparatively higher priced twill-back velveteens from Europe (chiefly from the United Kingdom and Germany) and were valued at about 75 cents a yard; between 1935 and 1940, however, imports were principally low-priced plain-back velveteens from Japan and were valued at about 15 cents a yard. In 1929, a year of relatively large production, the domestic output of finished velveteens amounted to about 6.7 million square yards, valued at about 5.5 million dollars; in 1932 production amounted to about 1.1 million square yards, valued at about \$800,000. Imports, under the reduced duties fixed in 1933, reached a record high of 5.2 million square yards in 1936, when Japan supplied about 98 percent of the total; domestic production in that year amounted to 3.6 million square yards and consumption to nearly 9 million square yards. Because of this great increase in imports, domestic producers, early in 1937, sought to obtain an increase in the rate of duty. Soon thereafter, however, an agreement was negotiated between domestic manufacturers and Japanese exporters, whereby exports of cotton velveteens from Japan to the United States were limited to an annual quota of 2 million square yards for two periods of 12 months each, beginning March 1, 1937. This arrangement was continued through December 1940, and remained in effect, by voluntary export control, through November 1941.

Consumption of cotton velveteens, as well as the quantity of both domestic production and imports, has varied widely from year to year. This has resulted only partially from changes in the level of national income. The demand for velveteens has been especially dependent on changes in style, a factor which may have an important but unpredictable (and consequently disregarded) effect on future consumption. Another important factor is the extent to which fabrics of synthetic materials will gain consumer appeal in this competitive field.

POST-WAR SHORT TERM

Domestic production of cotton velveteens has been curtailed during the war, and the output may be expected to increase in the immediate post-war period because of the backlog of demand for all kinds of cotton materials, particularly for clothing. Looms now producing essential war fabrics are readily convertible to the weaving of velveteens. Productive capacity in foreign countries has probably been so curtailed that it will be quite impossible for them to export any substantial quantities. The resumption of weaving in these countries will depend principally on the condition of their equipment. United States imports during the immediate post-war years will probably be small and almost wholly of British origin; until foreign production has been restored, total imports will probably be less than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Changes in style and consumer preference for other types of materials will undoubtedly be as important in determining United States consumption as the level of income or the duty. In the estimates

which follow it is assumed that consumption habits will not differ materially from those in 1939, that the productive capacity of Japan will be restored to about its pre-war level, and that imports from that country will not be limited by any special agreement similar to that in effect before the war. Because of the rise in cotton prices from their low level in 1939, together with subsequent increases in wages of textile workers, the prices of velveteens may not return to their 1939 level. In the following estimates, average domestic prices are assumed to be about 20 percent higher than in 1939. Unit values of foreign velveteens are assumed to increase about 15 percent for the Japanese and about 10 percent for the European goods; but because of the great disparity in unit prices between the Japanese and European velveteens (14 cents and 78 cents in 1939), the combined average price of the estimated imports would increase 20 to 35 percent, depending on the proportion of imports supplied by Europe and Japan.

Duty as in 1939.—Because of increased population, consumption might be 10 percent higher than in 1939, or about 7.5 million square yards. Imports, in the absence of any limitations on entries from Japan, would probably be much larger than in 1939, and might account for about 60 percent of domestic consumption. They would then be about 4.5 million yards, with a foreign value of about \$825,000. Production for the domestic market might be about 3 million yards, valued at 1.8 million dollars.

Duty reduced by 50 percent.—Consumption might increase to about 8 million square yards. Imports might be nearly 25 percent larger than with duties unchanged and might be about 5.5 million yards, with a foreign value of 1.1 million dollars. Production for the domestic market would then amount to about 2.0 million yards, valued at about 1.2 million dollars.

Duty increased by 50 percent.—Consumption might decline to about 7.3 million square yards. Imports might total 4 million yards, with a foreign value of about \$715,000, and production for the domestic market might be about 3.3 million yards, valued at 2.0 million dollars.

Per capita income 75 percent higher than in 1939.

In the past, consumption of velveteens has varied rather markedly with changes in the level of national income. But under a sustained high level of income, the response would probably be moderated by a tendency on the part of consumers to shift their purchases to higher quality and higher priced fabrics. Under such conditions, however, the total consumption of velveteens might be as much as 25 percent greater than with income as in 1939. Prices, it is assumed, would be 10–20 percent higher than at the 1939 income level. Under the higher income level, imports from Europe may increase substantially and, although prices might increase by only about 11–12 percent, the combined average unit values of imports (from both Europe and Japan) might increase about 45–60 percent above the average at the 1939 income level by reason of a larger proportion of high-priced goods.

Duty as in 1939.—Consumption might be 9.5 million square yards. Imports might be 5.5 million yards, with a foreign value of about 1.6 million dollars; production for the domestic market would then be about 4 million yards, with a value of about 2.7 million dollars.

Duty reduced by 50 percent.—Consumption might increase to 10 million square yards. Imports might amount to 6.8 million yards, having

a foreign value of 2.0 million dollars, and production for the domestic market, to about 3.2 million yards, valued at about 2.2 million dollars.

Duty increased by 50 percent.—Consumption might decline to 9.8 million square yards. Imports would total possibly 4.8 million yards, with a foreign value of about 1.3 million dollars, and production for the domestic market would be 4.5 million yards, valued at 3.1 million dollars.

Exports

United States exports of cotton velveteens have been relatively small. They amounted to about 90,000 and 36,000 square yards, valued at \$65,000 and \$27,000 in 1936 and 1937, respectively, the only years for which they were separately recorded. Principal markets were Mexico, Canada, and the Philippine Islands.

Employment

No data are available as to the number of persons employed in the production of cotton velveteens. It is estimated that between 600 and 1,000 persons were thus occupied in 1939. These workers were employed in mills which also produce related types of cotton fabrics, particularly corduroys, moleskins, sateens, and twills. Workers can be shifted with relative ease from one type of production to another in accordance with changes in style and consumption.

On the basis of the same per capita income that prevailed in 1939, but with a large increase in imports, the number of persons employed in making velveteens might be expected to be less than in 1939 or about 400–600 workers. On the basis of a 75-percent higher level of income than that in 1939, employment might range from 500–800 workers. Fifty percent reductions in rates of duty might lower employment from 20 to 30 percent, and 50 percent increases in rates of duty might increase employment by about 10 percent.

COTTON TABLE DAMASK

Tariff paragraph: 910.

Commodity: Cotton table damask and manufactures thereof.

Rate of duty: 30 percent ad valorem.

NOTE.—The rate fixed in the Tariff Act of 1930 was 30 percent ad valorem. From April 16, 1935, to April 21, 1939, the rate on cotton table damask and manufactures thereof, valued at 75 cents or more per pound, was 20 percent, pursuant to the Czechoslovak trade agreement, which has been suspended.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	4,900	60	4,840	2,479	7,328	Percent
Value (\$1,000).....	1 2,769	39	1 2,731	1 1,413		34
Unit value (per pound).....	1 \$0.55	\$0.65	1 \$0.56	\$0.57		
Persons employed (number).....	(5)					

¹ Estimated.

² Foreign value.

³ Estimated 500-600.

Cotton table damasks are Jacquard-woven fabrics with decorative designs, usually of floral patterns. They are ordinarily bleached and finished in various ways to imitate linen table damask. Some are made with combinations of colored warp or filling. Finished table damasks are sold as yard goods or as tablecloths, napkins, or sets.

Cotton table damask competes in its uses with tablecloths, napkins, etc., made of other types of woven fabrics, as well as with paper napkins and table doilies, and also with mats of paper, cloth, and other materials. The use of table tops of glass, plastics, or other similar hard surfaces in restaurants has also had a considerable effect on the consumption of table damasks. Production in the United States during the 1930's was less than half as much, in quantity, as during the 1920's. Since 1931, however, the annual domestic output has been fairly constant, and between 1931 and 1939 it averaged about 5.5 million pounds. Pre-war imports, which consisted almost entirely of finished damasks (whereas the figures for domestic production, mostly not finished, represent the value at the mill), showed a marked upward trend after 1936 and came chiefly from Japan. Other important sources were Czechoslovakia, Belgium, and the United Kingdom.

POST-WAR SHORT TERM

Consumption will probably be confined largely to domestic fabrics, inasmuch as the two principal suppliers, Japan and Czechoslovakia, may not be able to get into full production for some time. Industries of the other European suppliers, including the United Kingdom and Belgium, will probably be occupied in reconstruction and in supplying the needs in their respective countries. Domestic production may continue at the high war time level (about double that of 1939) to meet the backlog of civilian demand resulting from war shortages.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of cotton table damasks would probably respond to the expected increase in population; per capita consumption would probably approximate that of 1939. Total consumption might be between 7.7 and 8.5 million pounds, depending on the rate of duty. Unit values are assumed to be about 10-15 percent higher than those of 1939 because of anticipated higher price of cotton and higher costs of production.

Duty as in 1939.—Consumption might be 8 million pounds. Both production and imports may be expected to increase by about 10 percent over those of 1939, with production for the domestic market amounting to about 5.3 million pounds, valued at about 3.3 million dollars and with imports amounting to about 2.7 million pounds, valued at 1.8 million dollars (foreign value).

Duty reduced 50 percent.—This might result in imports about 40 percent larger than with duty as in 1939. Of the total probable consumption of about 8.5 million pounds, production for the domestic

market might supply about 4.7 million pounds, valued at 2.9 million dollars, and imports might supply 3.8 million pounds, valued at 2.5 million dollars (foreign value).

Duty increased 50 percent.—Imports might be one-fourth less than with duty as in 1939. Of the consumption of 7.7 million pounds, production for the domestic market might supply 5.7 million, valued at about 3.6 million dollars and imports about 2.0 million, valued at 1.2 million dollars (foreign value).

Per capita income 75 percent higher than in 1939.

Consumption of cotton table damask, particularly of the better qualities, would be substantially greater than with income as in 1939, and amount, perhaps, to about 9.3–10 million pounds annually. Unit values might be expected to be about 10 percent higher than at the 1939 income level.

Duty as in 1939.—Consumption might reach 9.5 million pounds. Production for the domestic market might be 6.4 million pounds, valued at about 4.5 million dollars; imports would then supply about 3.1 million pounds, valued at about 2.2 million dollars (foreign value).

Duty reduced 50 percent.—Consumption might increase to 10 million pounds. Imports would probably amount to 4.3 million pounds, valued at 3.1 million dollars (foreign value). Production for the domestic market would likely decrease to about 5.7 million pounds, valued at 4 million dollars.

Duty increased 50 percent.—Consumption might decrease to 9.3 million pounds. Imports might approximate 2.3 million pounds, valued at about 1.6 million dollars (foreign value). Production for the domestic market would probably reach about 7 million pounds, valued at 4.9 million dollars.

Exports

The United States exports of cotton table damasks have been relatively small, amounting ordinarily to about 2 percent of domestic production. In 1938–39 the average annual exports were about 150,000 square yards, with a value of about 36,000 dollars. Principal markets were Cuba, Canada, and Venezuela. It is believed that after the war exports will continue to be relatively unimportant.

Employment

No data are available showing the number of persons employed in the production of cotton table damasks. It is estimated that between 500 and 800 persons were thus occupied in 1939. Employment would probably not increase in the same proportion as production. If the per capita income is maintained at a level equal to that in 1939, the number of persons employed may be expected to remain the same. Under the most favorable conditions assumed employment might increase to 1,000.

COTTON QUILTS OR BEDSPREADS

Tarif Paragraph	Commodity	Rate of duty	Average ad valorem (1939)
911 (a)	Quilts or bedspreads:		
	Jacquard-figured	40% ad valorem	30%
	Not Jacquard-figured	25% ad valorem	

Note.—The rate on quilts or bedspreads, wholly or in chief value of cotton, whether in the piece or otherwise, if block-printed by hand, was reduced to 12½ percent by the trade agreement with India, effective June 28, 1944.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹			Imports	Apparent consumption	Ratio of imports to consumption
	Total	Exports	For domestic market			
Quantity (1,000 pieces)	10,000	113	9,887	2,021	12,308	Percent 20
Value (\$1,000)	11,000	110	10,890	1,520		
Value (per piece)	\$1.10	\$1.01	\$1.10	\$0.75		
Persons employed (number)	(?)					

¹ The figures for 1939 were somewhat above the pre-war average, see text.

² Estimated.

³ Foreign value.

⁴ Estimated 2,000-3,000.

Cotton bedspreads (quilts) are made in a variety of patterns and designs from double or single-cloth fabrics. Such bedspreads as the Marceilles, damask, satin, crochet, and similar woven-design types are Jacquard-figured; dimity, crinkle-cloth, and prints are not Jacquard-figured. More than three-fourths of the production, and from four-fifths to nine-tenths of the imports, have generally been Jacquard-figured. More than 80 percent of the imports of Jacquard-figured bedspreads in most pre-war years came from Italy. Imports of Jacquard-figured bedspreads from Japan, however, increased steadily from 1935 through 1940; of the total quantity imported, Japan supplied 14 percent in 1936, 19 percent in 1937, 16 percent in 1939, and 36 percent in 1940. Imports of quilts or bedspreads, not Jacquard-figured, have been mainly India or Persian prints of oriental designs from British India.

Production and imports were somewhat above average in 1939; for the 5-year period 1935-39 estimated production averaged 9.5 million bedspreads and imports 2.1 million.

Exports of cotton quilts, comforts, and bedspreads have usually been small, ordinarily not exceeding 2 percent of production.

POST-WAR SHORT TERM

Before the war about 80 percent of the imports of cotton quilts or bedspreads ordinarily came from Italy and Japan, and most of the rest from India. United States consumption in the immediate post-war period will therefore probably have to be supplied chiefly from domestic production. Imports in the years immediately following the close of the war will probably be mainly, if not exclusively, of Persian

prints from British India. Until production in other supplying countries has been restored, the imports from them may be expected to be much smaller than they were in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Taking account of population increase, consumption might be 10 percent higher than during the period 1935-39. It might amount to approximately 13 million bedspreads or quilts. Consumption would be relatively little affected by changes of 50 percent in the duty. Unit prices might be about 10-15 percent higher than in 1939 because of an expected increase in the prices of cotton.

Duty as in 1939.—Production might increase by the same percentage as consumption and might amount to about 10.5 million (including exports of about 100,000), valued at about 13 million dollars. Imports might be about 2.6 million, with a foreign value of about 2 million dollars.

Duty reduced 50 percent.—Imports would probably increase substantially, possibly by nearly 50 percent compared with those at the duty level of 1939. They might amount to about 3.8 million, with a foreign value of about 2.9 million dollars. Production (including small exports) might decline to about 9.3 million, valued at 11.6 million dollars.

Duty increased 50 percent.—This would probably result in a sharp decline in imports, perhaps to about 1.5 million, with a foreign value of something more than 1 million dollars. Production (including small exports) would probably increase substantially, to about 11.6 million bedspreads, valued at about 14.5 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of cotton bedspreads and quilts would probably be about 20 percent greater than if there were no change in per capita income and might be about 15.5 million a year. Prices might increase to the same extent as the general price level, that is, 10-15 percent.

Duty as in 1939.—Production (including small exports) might amount to about 12.4 million bedspreads, valued at about 17.4 million dollars, and imports to about 3.2 million, with a foreign value of about 2.7 million dollars.

Duty reduced 50 percent.—Imports would probably amount to at least 5 million bedspreads, with a foreign value of 4.3 million dollars. Production (including exports) might amount to 10.6 million, valued at about 14.8 million dollars.

Duty increased 50 percent.—Imports might amount to about 2.3 million bedspreads, with a foreign value of about 2 million dollars. Production (including exports) might possibly reach 13.3 million, valued at nearly 18.6 million dollars.

Exports

In the last two decades exports of quilts, bedspreads, and comfortables averaged about 107,000 annually, valued at \$155,000. During the past decade exports amounted to less than 2 percent of

domestic production (on the basis of quantity) and were the equivalent of about 4-8 percent of the imports. The principal markets have been Canada and Central and South American countries. In the post-war period exports are not likely to exceed those in pre-war years. The markets will probably be widely scattered but Canada and Latin-American countries will no doubt be the most important.

Employment

No official data are available on the number of persons employed in the production of cotton quilts or bedspreads, but it is estimated that between 2,000 and 3,000 persons were thus occupied in 1939. If the per capita income is maintained at a level equal to that in 1939, the number of persons employed would probably remain about the same. At the higher level of income, employment might increase to 3,500 persons.

COTTON TABLE COVERS, ETC., PLAIN-WOVEN

Tariff paragraph: 911 (b).

Commodity: Table and bureau covers, centerpieces, runners, scarfs, napkins, and doilies, made of plain-woven cotton cloth and not specially provided for.

Rate of duty: 30% ad val.

NOTE.—The rate shown above is that fixed by the Tariff Act of 1930. It was reduced to 15 percent on such of the articles named which are block-printed by hand, pursuant to the trade agreement with Iran, effective June 29, 1944.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	1 3,000	1 20	1 2,980	1 479	1 3,458	Percent 14
Persons employed.....	(?)					

¹ Estimated.

² Landed value; foreign value was \$355,000.

³ Not separately recorded.

The above classification was inserted in the Tariff Act of 1922 to secure separate enumeration of imported specialties made of coarse sheeting stencil-dyed in indigo and known in the trade as Japanese blueprints. Other plain-woven articles printed in varicolored oriental designs and imported under the name of India prints are included, as well as staple and special plain-woven articles produced in Europe and elsewhere and sold unbleached, bleached, printed, dyed, or colored.

Imports from Europe have been mainly high-grade machine- or hand-printed articles in sets, including tablecloths and napkins. Imports from Japan, at first only blueprints, expanded to include printed tablecloths, napkins, and similar articles imported mainly because they were lower priced than most similar domestic products.

The cessation of imports from Japan has reduced supplies of these low-priced articles and has resulted in the substitution of higher priced domestic and imported textiles, or of tablecloths, napkins, and doilies made of paper; the last-named articles have been extensively used in recent years, particularly in restaurants, tearooms, and taverns.

Domestic production of table and bureau covers, etc., made of plain-woven cotton cloth is not separately recorded, but the output of printed or yarn-dyed articles that are competitive with the imported specialities is known to be large and to supply the greater part of the domestic demand. Productive capacity, ordinarily ample to meet all domestic requirements for either the cloth or paper articles, has been largely diverted during the war to production of more essential items. Exports of these articles are not separately reported, but are known to be small.

Statistical data are not available upon which to base any quantitative estimates for imports, production, or exports.

POST-WAR SHORT TERM

High purchasing power, the building and furnishing of new homes, and the requirements of restaurants, tearooms, and taverns will probably create a demand two or three times greater than that in 1939. It is also probable that imports will not be as great as those in 1939, principally because pre-war suppliers will probably be confronted with the problems of meeting home demand and of securing supplies of raw materials.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

In the following discussion it is assumed that both imports and production will increase 10 percent in quantity over 1939, because of population increase, and that the unit prices of both will be higher than in 1939 by amounts that will depend on the level of the tariff. The average price of all cotton cloths was comparatively low in that year. The total value of consumption is estimated at 4-5 million dollars, depending to some extent on the level of duties.

Duty as in 1939.—Both imports and production would probably be about 10 percent larger in quantity and their unit prices about 20 percent higher than those in 1939. Imports would probably have a foreign value of about \$500,000 and domestic production a value of about 4 million dollars.

Duty reduced by 50 percent.—The quantity of imports would probably be about $2\frac{1}{2}$ times as large as under unchanged duties, but inasmuch as the proportion of lower grade goods among the imports would probably be higher, unit prices would be, say, 10 percent below those assumed under unchanged duties. The total foreign value of the imports therefore might be about 1.1 million dollars. Because of increased imports, production could be expected to decrease about 10 percent (both in quantity and in unit value) below that estimated under the unchanged duty level. The total value of domestic production would then be about 3.3 million dollars.

Duty increased by 50 percent.—Imports might be barely 40 percent of the quantity with duty unchanged, and unit prices about 30 percent higher. The total foreign value of imports would, therefore, be about \$250,000. Domestic production would probably be about 5 percent greater in both quantity and unit value than was estimated on the basis of duties unchanged, and the total value of domestic production would then be about 4.2 million dollars.

Per capita income 75 percent higher than in 1939.

The demand for all textiles would probably increase to such an extent that despite the competition from other materials, principally those made of paper, the consumption of plain-woven-cotton table and bureau covers, centerpieces, etc., might be as much as 40 percent greater in quantity and 10 percent higher in average unit values, than that estimated with per capita income and the rate of duty unchanged. Such a consumption might be valued at from 6-7 million dollars, depending on the level of tariffs.

Duty as in 1939.—Both imports and production would possibly be 40 percent higher in quantity and 10 percent higher in unit values than estimated on the basis of income at the 1939 level. The total foreign value of imports might be about \$700,000 and the total value of production about 5.9 million dollars.

Duty reduced by 50 percent.—In quantity, imports would be more than 2½ times as large and production about 10 percent lower than was estimated above on the premise of duties unchanged. Because imports in these circumstances would probably include a larger proportion of low-grade goods, their unit values, as well as the unit values of domestic production, would probably average about 10 percent lower than was estimated on the premise of no change in duty. The total foreign value of imports might be about 1.7 million dollars and the total value of domestic production about 4.8 million dollars.

Duty increased by 50 percent.—Because imports would be predominantly of the higher grades, the quantity imported would probably be about 60 percent as large, and the unit value about 20 percent higher, than were estimated on the basis of unchanged duties. Production would probably be as high as that estimated with no change in the duties, but unit values would average about 10 percent higher. The total foreign value of imports in these circumstances would be about \$500,000 and the total value of domestic production, approximately 6.3 million dollars.

Exports

United States exports of cotton table and bureau covers, etc., made of plain-woven cloth are not separately reported, but are known to be small, possibly in the neighborhood of \$25,000.

Employment

These specialties are made in various types of establishments which may or may not be devoted principally to their production. No separate enumeration has been made of the employees engaged in the production of such articles, and there is, therefore, no basis for making estimates of employment.

BELTS AND BELTING OF VEGETABLE FIBER

Tariff paragraph: 913 (a).

Commodity: Belts and belting, for machinery, of cotton or other vegetable fiber.

Rate of duty: 20% ad val. Subject to additional duty of 10 cents a pound on the cotton contained therein having a staple of 1 1/4 inches or more in length, as provided for in paragraph 924; this provision has little effect on the rate.

NOTE.—The rate fixed in the Tariff Act of 1930 was 90 percent ad valorem, which was reduced to 20 percent, effective January 1, 1939, pursuant to trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 7, 000	266	1 6, 840	223	1 6, 970	Percent 3
Value (\$1,000).....	3, 009	141	3, 408	1 100		
Unit value (per pound).....	1 30.51	\$0.53	1 30.53	\$0.43		
Persons employed (number).....	(?)					

¹ Estimated.
² Foreign value.
³ Estimated, 400-600.

Belts and belting, for machinery, of cotton or other vegetable fibers include: Single and multiple belting of wide widths, woven on fly-shuttle looms; narrow widths, woven on narrow-ware or webbing gang looms; and belting made of layers of cotton canvas stitched together and treated with oil, paraffin, or other proofing materials. Both woven and stitched belting are produced for transmission, elevator, and conveyor service. Although consumption of transmission belting has gradually been declining because of the increasing use of direct motive power (principally by electric motors), there is still an active demand from small shops which use belting with small power units.

Imports include principally solid endless belts, belts used on textile-printing machines, and wide paper-felt conveyor belts. Imports have been almost entirely from the United Kingdom.

United States production of woven cotton belting and of stitched canvas belting is reported (by value) by the Bureau of the Census as part of "cotton narrow fabrics" and among the "miscellaneous fabricated textile products." Finished textile belting is produced both by mills which weave and those which purchase the fabric. In addition to belting, these mills frequently produce such articles as tents, awnings, tarpaulins, webbing and tapes, and fire hose.

Domestic production declined in value from 9.5 million dollars in 1925 to about 2.5 million dollars in 1933, but recovered to an annual value of about 3.6 million dollars in 1937 and 1939. In the 1933-42 decade the annual average of imports amounted to about 222,000 pounds with a foreign value of \$108,000.

POST-WAR SHORT TERM

Consumption of belts and belting of cotton or other vegetable fiber will likely be at the 1939 level of about 7 million pounds, supplied principally by domestic producers. During the first year or two after the war, the rehabilitation of European industries will create an increased demand for belting in that area, with the result that United States imports may be less than in 1939 or earlier years.

POST-WAR LONG TERM

Consumption, Production, and Imports

Total consumption may be expected to vary more or less directly with changes in the level of national income or industrial activity. Because machine belting is a semidurable industrial appliance, consumption probably will not vary to any great extent with changes in prices or in the rates of duty.

Per capita income at 1939 level.

Consumption will probably be about the same as in 1939 or about 7 million pounds. In view of the trend toward direct motive power, domestic production is not expected to increase as much as the population if the national income is at the 1939 level. The need for transmission belting by small power units, however, will tend to maintain a fairly large consumption of such products. Likewise, paper mills and conveyor units will continue to require substantial quantities of wide belts. Prices might increase about 20 percent because of anticipated higher prices for cotton fabrics.

Duty as in 1939.—Imports might be about 250,000 pounds, with a foreign value (at increased prices) of about \$125,000. Production for the domestic market might be about the same as in 1939, or about 6½ million pounds, valued (at increased prices) at a little more than 4.0 million dollars.

Duty reduced 50 percent.—Imports might amount to about 300,000 pounds, with a foreign value of about \$150,000. Production for the domestic market might decrease by nearly the amount of the added imports to something less than the 1939 figure and approximate 6.7 million pounds, valued at about 4.0 million dollars.

Duty increased 50 percent.—Imports would perhaps decline to about 225,000 pounds, with a foreign value of \$115,000. Production for domestic consumption would probably increase by nearly the amount of change in imports to nearly 6.8 million pounds, valued at about 4.1 million dollars.

Per capita income 75 percent higher than in 1939.

Largely because of the probable increase in activity in establishments requiring conveyor and transmission belting, consumption might be about 15 percent larger than with unchanged income and increase to about 8 million pounds. Both production and imports might be expected to increase in volume as a result of the increased industrial activity. Prices might be 20 percent higher than with income as in 1939.

Duty as in 1939.—If the rate of duty remained unchanged at the higher income level, imports might increase to about 300,000 pounds, with a foreign value of \$180,000. Production for the domestic market would thus be about 7.7 million pounds, valued at about 5.4 million dollars.

Duty reduced 50 percent.—Imports might increase to about 375,000 pounds, with a foreign value of about \$225,000. Production for domestic consumption might decline from what it would have been with no change in the rate of duty, but by somewhat less than the increase in imports. It might amount to about 7.6 million pounds, valued at about 5.3 million dollars.

Duty increased 50 percent.—At the higher income level, imports would probably be somewhat larger than they were in 1939 notwithstanding the higher duty, possibly about 250,000 pounds, with a foreign value of about \$150,000. Production for the domestic market thus might amount to 7.8 million pounds, valued at about 5.6 million dollars.

Exports

Exports of woven belting declined from 548,000 pounds, valued at \$292,000, in 1926 to 134,100 pounds, valued at \$60,000, in 1932; they increased to 484,100 pounds valued at \$228,600 in 1940. Ordinarily only about 5 percent of the United States production is exported. Canada has been the principal market, taking from 27 to 52 percent of the total. Other foreign markets include Argentina and Mexico. After the war, United States exports will probably continue to be small relative to the domestic output.

Employment

Data are not available which show the number of employees engaged in the production of woven or stitched belting. The number so employed under the 1939 income level might be estimated at between 400 and 600, and under the assumed higher income level, at between 450 and 700.

KNIT COTTON GLOVES AND MITTENS

<i>Tariff para- graph</i>	<i>Commodity</i>	<i>Rate of duty</i>	<i>Average ad valorem (1939)</i>
915 and 917...	Knit cotton gloves and mittens:		
	Of warp-knit fabric.....	60% ad val.....	} 55%.
	Of other knit fabric.....	50% ad val.....	
	Knit or crocheted.....	45% ad val.....	

NOTE.—The above rates are those fixed in the Tariff Act of 1930. From April 16, 1938, to April 21, 1939, inclusive, the rate was 50 percent on warp-knit fabric gloves and mittens valued at \$1.50 or more per dozen pairs, pursuant to the trade agreement with Czechoslovakia, which has been suspended. An additional duty of 10 cents per pound on long-staple cotton (1¼ inches or more in length) contained in gloves covered by this report, is imposed by the tariff act. The additional duty was not affected by the Caschlovak. agreement. Although in many years gloves were undoubtedly one of the most important imports on which the additional duty was assessed, no data are available on which to calculate the amount of the duty thus collected. It is not included in the average ad valorem computation.

The foregoing rates also cover gloves and mittens of vegetable fiber other than cotton, but these gloves or mittens constitute a negligible proportion of imports or of domestic production.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 doz. pr.).....	1 4,034	(2)	(2)	796	4,830	Percent 16
Value (\$1,000).....	1 \$5,030	(2)	(2)	1 1,413		
Unit value (per doz. pr.).....	\$1.49	(2)	(2)	\$1.77		
Persons employed (number).....	1 2,000					

¹ Includes articles (made in knitting mills) for which the constituent material was not stated but which were probably chiefly of cotton, as follows:

(1) Gloves and mittens of circular-knit fabric (272,800 dozen pairs, valued at \$940,509), and (2) string gloves (44,446 dozen pairs, valued at \$158,707).

² Not available. Exports of knit or knit-fabric cotton gloves are not stated separately from exports of woven-fabric cotton gloves. Exports in 1939 of cotton gloves of all types were 77,569 dozen pairs, valued at \$137,628.

³ Foreign value.

⁴ Estimated.

Knit cotton gloves fall into two general categories: (1) Work gloves which may be very inexpensive, and (2) dress gloves which vary greatly in quality and price. Consumption of work gloves moves rather closely with general industrial activity, whereas purchases of dress gloves depend greatly on fashions and income. On the basis of limited data available, estimated total consumption of cotton knit gloves during the 5-year period 1935-39 averaged between 5.5 million and 6 million dozen pairs, well above the 1939 figure. Roughly half of the total is estimated to have been work gloves and half dress gloves.

Imports declined from an annual average of 2.3 million dozen pairs in the 5 years 1930-34 to an average of 1.6 million in the 5 years 1935-39,¹ and constituted about 40 percent and 30 percent, respectively, of estimated consumption during these periods. Imports consisted almost entirely of dress gloves. Before 1935 they were primarily sueded warp-knit fabric gloves, a type of dress glove in the production of which Germany specialized. When Germany ceased to be an important supplier after 1935, imports of similar gloves from Czechoslovakia increased, but not in sufficient quantities to offset the decline in imports from Germany. There was also an increase in imports of dress gloves of other much less expensive types, resulting in a lower average foreign unit value of total imports in the immediate pre-war years than in the period before 1935. Japan was the principal source of these imports.

Data on domestic cotton knit-glove production before 1939 are fragmentary, but from available information it appears that until 1935 the domestic output consisted almost entirely of work gloves. Thereafter the production of cotton dress gloves increased considerably, but before the war it never amounted to more than a small fraction of the quantity previously imported from Germany. The deficiency in the supply of cotton dress gloves was made up largely by the domestic production of rayon gloves. During the war a marked expansion occurred in the production of cotton warp-knit fabric gloves.

¹ Including those statistically recorded as woven gloves in 1935 and 1936.

Other synthetic fibers, such as nylon and vinyon, might become competitive with cotton for the production of dress gloves. In general, however, it would appear that warp-knit fabric gloves made of cotton have some advantage over those made of rayon or other synthetic yarns in appeal to the consumer, except as the style factor may cause a shift from cotton.

POST-WAR SHORT TERM

Demand will probably keep pace with general industrial activity. Assuming this to be at a high rate the domestic cotton knit-glove industry will doubtless be fully occupied, particularly since imports may not be readily available.

POST-WAR LONG TERM

Consumption, Production, and Imports

The estimates that follow are based on the assumptions that cotton gloves will retain their relative popularity, and that the industries in Germany and Czechoslovakia will regain their former positions in world trade.

Per capita income at 1939 level.

Duty as in 1939.—Per capita consumption would probably be about the same as in the years 1935-39. Allowing for an increase in population, total consumption might increase 10 percent and amount to about 6¼ million dozen pairs. The share supplied by imports would probably be somewhat less than it was in 1935-39, say perhaps about 25 percent. Imports would then be about 1.5 million dozen pairs, with a foreign value of about 3.2 million dollars. This value allows for an increase of 20 percent in the average foreign unit value above that of 1939 because the proportion of the more expensive warp-knit fabric gloves is expected to increase. Production for the domestic market might then be about 4¼ million dozen pairs, valued at about 10 million dollars. While work gloves would probably be more than half the total, they would account for a smaller proportion than in 1939 because of the increased production of dress gloves. Consequently the average unit value might be about 50 percent above that of 1939.

Duty reduced by 50 percent.—Consumption might be about 10 percent greater than with no duty change, or be about 7 million dozen pairs. Imports might double, or be about 3.0 million dozen pairs. With a slightly lower unit value (possibly \$2.00 per dozen pairs) the total foreign value of imports might be about 6 million dollars. Production for the domestic market, consisting in large part of work gloves, might be about 4 million dozen pairs at an average value approximating \$1.80 per dozen pairs, or a total value of about 7.2 million dollars.

Duty increased by 50 percent.—Consumption would very probably decline and there would probably be some shift to rayon gloves. Consumption might be about 6 million dozen pairs of which imports, largely confined to the better qualities, would possibly supply about 15 percent, or 1 million dozen pairs. With an average foreign unit value (about \$2.30 per dozen pairs) slightly in excess of that at no duty change, the total foreign value of imports might be about 2.3

million dollars. About 5 million dozen pairs would then be produced for the domestic market. Production of dress gloves would be stimulated more than that of work gloves, thus increasing the average unit value to perhaps 10 percent above that at no duty change. At about \$2.30 per dozen pairs the total value would be 11.5 million dollars.

Per capita income 75 percent higher than in 1939.

Because gloves are apparel accessories purchased both for costume variety and for utility (but representing a relatively small part of the consumer's expenditure), consumption would probably be as much as 40 percent larger than that with income as in 1939. This increase would probably be apportioned between imports and domestic production in about the same ratio as under the lower income level. The average unit values of domestic gloves would probably increase more than the average foreign unit values of imports because the proportion of dress gloves in production is expected to increase whereas the composition of the imports, already predominantly dress gloves, would not change substantially. Domestic average unit values are estimated at approximately 20 percent and average foreign unit values at approximately 10-15 percent above those at the lower income level.

Duty as in 1939.—Consumption might be about 8½ million dozen pairs. Imports might be 2 million dozen pairs, with a total foreign value of about 5 million dollars. Production for the domestic market would then be 6½ million dozen pairs, valued at 17 million dollars.

Duty reduced by 50 percent.—Consumption might be 10 million dozen pairs; imports 4 million dozen pairs, with a foreign value of about 9 million dollars; and production for the domestic market 6 million dozen pairs, valued at about 13 million dollars.

Duty increased by 50 percent.—Consumption would probably be about 8.5 million dozen pairs; imports might be 1¼ million, with a foreign value of about 3¼ million dollars; and production for the domestic market 7¼ million dozen pairs, valued at about 20 million dollars.

Exports

Exports of knit cotton gloves are not stated separately from exports of woven cotton gloves, but the total quantity and value is very small compared with consumption, imports, or production. Exports of knit cotton gloves would probably continue to be negligible.

Employment

Employment might range from about 2,200 to 4,000 under the various assumptions as to income level and changes in rates of duty.

COTTON HOSIERY

Tariff paragraph: 916.

Commodity: Hosiery, wholly or in chief value of cotton or other vegetable fiber (not including embroidered hosiery).

Rate of duty: 50% or 30% ad val.

Average ad valorem (1939): 50%

NOTE.—An additional duty of 10 cents per pound is imposed on any cotton 1¼ inches or more in staple length which is contained in hosiery covered by this report. No data are available on which to calculate the amount of the duty thus collected, and it is not included in the ad valorem computation.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity ¹ (1,000 dozen pairs).....	63,140	470	62,670	1,043	63,713	Percent
Value ² (\$1,000).....	74,508	855	73,818	³ 338		1.6
Value (per dozen pairs).....	\$1.18	\$1.46	\$1.18	\$0.32		
Persons employed (number).....	⁴ 35,000					

¹ Production includes 54,706,000 dozen pairs all-cotton hosiery, and 8,431,000 pairs of hosiery probably in chief value of cotton, valued at \$58,184,000 and \$16,319,000, respectively. Export data are for hosiery commercially known as cotton hosiery. Import data are for hosiery in chief value of cotton, not embroidered. There are some imports of embroidered cotton hosiery.

² Foreign value.

³ Estimated.

Consumption of cotton hosiery (all-cotton and cotton-mixed¹) increased from 60.5 million dozen pairs in 1929 to 63.7 million dozen pairs in 1939; the share of cotton hosiery in total hosiery consumption, however, declined from 58 percent in 1929 to 42 percent in 1939. This decline in the relative position of cotton hosiery was largely the result of the rapid increase in the consumption of silk and of rayon hosiery, accelerated by the growing demand for full-fashioned silk hosiery. The types of hosiery in which cotton continues to be important are men's half-hose and slack socks, children's hosiery, and anklets for women and teen-agers. The consumption of much of the cotton hosiery in these categories has its origin in the mode for casual dress which had prevailed for a number of years before the war. The same types of hosiery can be made from rayon staple fiber in textures similar to cotton.

Imports in the 3 years 1931-33 averaged 468,000 dozen pairs of which 80 percent were of German origin. The imports from Germany decreased abruptly in 1934 and did not recover in subsequent years. From 1935 to 1939 imports increased markedly and averaged about 1.2 million dozen pairs annually. Japan was by far the most important supplier during this period and accounted for about 86 percent of the total. Fairly substantial quantities entered also from China, and small amounts from Germany, France, the United Kingdom, Spain, and Italy. Whereas, the imports from Europe consisted of high-priced hosiery, with an average foreign unit value of about \$3 in 1939, the unit value of the hosiery (of poorer quality) coming from the Far East averaged 26 cents.

Domestic production of cotton hosiery was 63.6 million dozen pairs in 1929, declined to 49.5 million in 1931, and increased to 63.1 million dozen pairs in 1939.¹

POST-WAR SHORT TERM

Lack of materials and shortage of labor during the war resulted in depletion of civilian supplies of full-fashioned hosiery and of hosiery for men. Demand for cotton hosiery will probably continue to be

¹ Includes hosiery not specified by constituent materials.

very large. Heavier types of hosiery, such as anklets and slack socks, will probably be in strong demand, if for no other reason than the shortage of other types of hosiery.

POST-WAR LONG TERM

Consumption, Production, and Imports

Future demand for cotton hosiery will be greatly influenced by trends in fashion, by men's preference for particular styles, and by the relative price of cotton yarn compared with other yarn, particularly rayon. In the estimates that follow, it is assumed that the price relationship of domestic and foreign cotton will not be more unfavorable to United States manufacturers than it was in 1939; and that cotton will continue to be preferred for certain types of hosiery.

Per capita income at 1939 level.

Per capita consumption of cotton hosiery will probably be somewhat smaller than in 1939 because of the pre-war trend towards use of newer fibers (particularly rayon) in hosiery manufacture, which is expected to continue. The average price of domestic hosiery will probably be about 20 percent higher than in 1939, largely because of the expected increase in the price of cotton yarn, and thus be about \$1.40 per dozen pairs. The average foreign unit value of the imports might be considerably higher than in 1939, when about 98 percent of the imports consisted of low-priced Far Eastern hosiery, since it is assumed that imports of the higher-priced hosiery from Europe would increase substantially over the 1939 level.

Duty as in 1939.—Consumption might remain at about the 1939 level despite population increase, or be about 64 million dozen pairs. Imports would probably supply about 2 percent (average for 1935-39) of consumption, or be about 1¼ million dozen pairs. With an average foreign unit value of 45 cents (because imports would constitute a larger proportion of higher-priced European hosiery) the total foreign value might be about \$600,000. Production for the domestic market would be 62½ million dozen pairs, valued at approximately 87.8 million dollars.

Duty reduced by 50 percent.—Consumption would probably increase to about 65 million dozen pairs. Imports might be more than three times larger than with the duty unchanged, and account for about 7 percent of consumption. They might thus be about 4.5 million dozen pairs. Because medium- and high-priced hosiery would constitute a much larger share of total imports than if the duty were unchanged, the average foreign unit value might double, or be 90 cents. The total foreign value of imports would therefore be about 4 million dollars. Production for the domestic market would in this case be about 60½ million dozen pairs, valued at about 84.7 million dollars.

Duty increased by 50 percent.—Consumption would probably remain nearly as large as with an unchanged duty, or be about 64 million dozen pairs. The share of imports in consumption would probably decline to about 1½ percent, so that imports would be 1 million dozen

pairs, of which the low-priced hosiery would constitute a larger proportion than with no change in duty. Thus the average foreign unit value might be about 10 percent below that with no change in duty, or be 40 cents. The foreign value of imports would then be about \$400,000. Production for the domestic market might thus be about 63 million dozen pairs, valued at about \$8.2 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption would probably be 10 percent larger than with income as in 1939. The average unit value of both the foreign and domestic hosiery would probably be 10-15 percent higher than at the lower income level.

Duty as in 1939.—Consumption would probably be about 70 million dozen pairs, of which imports might supply about 1.5 million dozen pairs, with a total foreign value of about \$775,000. Production for the domestic market would probably be about 68.5 million dozen pairs, valued at nearly 110 million dollars.

Duty reduced by 50 percent.—Consumption would probably be about 72 million dozen pairs. Imports might be about 5 million dozen pairs, with a total foreign value of about 5 million dollars, and production for the domestic market about 67 million dozen pairs, with a total value of about 107 million dollars.

Duty increased by 50 percent.—Consumption would be almost as great as if the duties were unchanged, or be about 70 million dozen pairs. Imports might supply a slightly larger share of consumption than under the similar assumption at the lower income level, because of the consumer's greater ability to purchase goods for novelty and also to pay a higher price. Imports might constitute about 1.8 percent of consumption, or be about 1½ million dozen pairs, with a total foreign value of about \$575,000. Production for the domestic market would then be about 68½ million dozen pairs, valued at about 110 million dollars.

Exports

Export demand may be heavy in the post-war short-term period; but, as production of seamless cotton hosiery is one of the earliest forms of apparel manufacture undertaken in countries developing manufacturing industries, exports are not very likely to be sustained on a large scale. Certain United States qualities or brands, however, may continue to have a foreign market about the same as in 1939 when nearly 0.5 million dozen pairs, valued at 0.7 million dollars, were exported.

Employment

Under the various conditions assumed, the number of persons employed would remain much the same as it was in 1939. Probably it would not change more than about 3 to 7 percent. Under the assumptions of increased production, total employment might be about 37,000, and under the assumptions of decreased production, about 34,000.

PLAIN COTTON HANDKERCHIEFS

Tarif paragraph: 918.

Commodity: Cotton handkerchiefs and woven mufflers.

Rate of duty: Unhemmed, dutiable as cloth; hemmed or hemstitched, dutiable as cloth plus 10% ad val. *Average ad valorem (1939):* 41%.

NOTE.—The rates on cotton handkerchiefs and woven mufflers were affected by the duty changes which were made on cotton cloth, since these articles are dutiable at the rates applicable to the cloth from which made. The additional duty for hemming or hemstitching has not been changed.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export	For domestic market			
Quantity (1,000 dozen).....	25,000	288	24,612	2,736	27,348	Percent
Value (\$1,000).....	15,000	247	14,753	480		10
Unit value (per dozen).....	\$0.60	\$0.84	\$0.60	\$0.176		
Persons employed (number).....	4,000					

¹ Production in continental United States and Puerto Rico.

² Estimated.

³ Foreign value.

Plain cotton handkerchiefs constitute the bulk of the handkerchiefs of all kinds consumed in the United States. The term "plain," as here used, means not ornamented with lace, embroidery, applique, or drawnwork.

The cloths used in the domestic production of cotton handkerchiefs are mostly print cloths woven of carded yarns from 28s to 42s, long-cloths woven of combed yarns from 40s to 60s, and lawns woven of combed yarns from 60s to 100s or finer. The bulk of these are bleached, with a smaller amount printed or dyed. A fairly substantial quantity is made of yarn-dyed cloth.

Total handkerchiefs (cotton and linen) produced in continental United States in 1939 were about 35.8 million dozen, valued at 20.8 million dollars. Adding 5.5 million dozen estimated as made in Puerto Rico¹ would give a total United States production of 41.3 million dozen. It is estimated that about 10 million dozen (6.5 in continental United States and 3.5 in Puerto Rico) were embroidered, which would leave 31.3 million dozen as production of plain (i. e., unornamented) handkerchiefs. It is estimated that of these about 25 million dozen were cotton and 6.3 million dozen were linen.

The production of cotton handkerchiefs in continental United States is largely concentrated in or around the city of New York, in the States of New Jersey and New York; there are also substantial quantities

¹ Shipments of handkerchiefs from Puerto Rico to continental United States in 1939 were recorded as 6½ million dozen, but it is estimated that about 1 million dozen of these were made in continental United States and returned after finishing with embroidery or hand-rolled hems.

produced in Pennsylvania and smaller quantities in Rhode Island, North Carolina, and other States.

United States imports of plain cotton handkerchiefs increased from a low point of 805,000 dozen in 1933 to the record of 5,165,000 dozen in 1935 and were 2,736,000 dozen in 1939. Of the 1939 imports, 276,000 dozen were unhemmed and therefore dutiable as cloth, whereas 2,460,000 dozen were hemmed or hemstitched and dutiable as cloth plus 10 percent ad valorem. Of total imports in 1939, Japan supplied 82 percent of the quantity but only 39 percent of the value. Imports from Japan averaged only 8.4 cents per dozen (foreign value) as compared with 40 cents per dozen from the United Kingdom, the next most important supplier, and approximately \$1.00 per dozen from Switzerland and France. The handkerchiefs from Japan were made of much coarser cloth than those from Europe.

POST-WAR SHORT TERM

The immediate post-war demand for plain cotton handkerchiefs will probably be substantially above that in 1939. Civilian requirements will be large; they have not been fully met during the war, principally because of the handkerchief needs of the armed forces. On the assumption that Japan will not be a factor of consequence, imports will probably be much smaller than in 1939, and at least 95 percent of the consumption will be supplied by domestic production.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—Per capita consumption would probably be about the same in quantity as in 1939. Because of the increase in population, however, total consumption would be about 10 percent more than that of 1939, and therefore be about 30 million dozen. For both production and imports, unit prices would perhaps be about 20 percent higher than in 1939, because of the likelihood of increased costs, particularly of the basic material, cotton cloth. The ratio of imports to consumption would probably be approximately the same as in 1939. Imports would then be about 3 million dozen, with a foreign value of \$633,000, and production for the domestic market would be about 27.5 million dozen, valued at 19.8 million dollars.

Duty reduced by 50 percent.—Consumption would be somewhat greater than that estimated with duty unchanged and might be 31 million dozen. Imports might be double the quantity estimated on the basis of duties unchanged, and with no appreciable change in foreign unit prices would total about 6 million dozen, with a foreign value of about 1.3 million dollars. Production for the domestic market would then be about 25 million dozen and, with somewhat lower unit prices, would be valued at about 16.2 million dollars.

Duty increased by 50 percent.—Imports might be about two-thirds of the quantity estimated on the basis of duties unchanged, but with no appreciable change in foreign unit prices. Imports would then total about 2 million dozen, with a foreign value of about \$420,000. Consumption would be somewhat less than with duty unchanged,

and might be about 29.5 million dozen. Production for the domestic market would probably be about the same as that estimated for unchanged duties; that is, 27.5 million dozen, valued at 19.8 million dollars.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Consumption might be about 20 percent higher in quantity than with income the same as in 1939, and therefore approximate 36 million dozen. For both production and imports, unit prices might be about 25 percent above those estimated under unchanged income, because of anticipated higher costs, particularly of cotton cloth. Imports might be about 50 percent greater than with income as in 1939, or about 4½ million dozen, with a foreign value of 1.2 million dollars. Production for the domestic market would then be about 31½ million dozen, valued at 28.4 million dollars.

Duty reduced by 50 percent.—Consumption would be somewhat higher than with the duties unchanged, and might be 37.5 million dozen. Imports would probably be double the quantity estimated with unchanged duties, and, with no appreciable change in foreign unit prices, would total about 9 million dozen, with a foreign value of 2.3 million dollars. Production would then be about 28.5 million dozen, and with somewhat lower unit prices, be valued at about 22.8 million dollars.

Duty increased by 50 percent.—Consumption would be somewhat lower than with duties unchanged, and might be about 35 million dozen. Imports might decrease to about half of the quantity estimated on the basis of unchanged duties, and amount to about 2½ million dozen, with a foreign value of about \$600,000. Production might be about 32½ million dozen, valued at about 29.5 million dollars.

Exports

United States exports of cotton handkerchiefs have fluctuated widely, from 397,000 dozen in 1923 down to 69,000 dozen in 1933, and up to 388,000 dozen in 1939 and 935,000 dozen in 1942. Exports have been widely distributed; in pre-war years the largest markets were the Philippine Islands, Cuba, and Canada. United States exports in the early post-war period will probably be very large. In the long run, especially if Japan should again become a competitor, exports will probably revert to their pre-war status and average probably not much more than 250,000 dozen a year.

Employment

According to census reports, 4,839 persons in continental United States were engaged in making handkerchiefs of all kinds in 1939. The number engaged in making plain cotton handkerchiefs is not reported but may be estimated at about 4,000. No data are available on employment in Puerto Rico. If employment in continental United States moves up or down in proportion to differences in estimates of total production made herein, under the various assumptions, then (assuming the same ratio of employment to production as in 1939) the number employed in the long-term period might be anywhere from 4,700 to 6,000.

COTTON WEARING APPAREL

Tariff paragraph: 919.
Commodity: Cotton wearing apparel,
 not knit.

Rates of duty: Various. *Equivalent ad valorem (1939):* 31%.

NOTE.—The articles covered by this report were dutiable under the Tariff Act of 1930 at 37½ percent ad valorem, except shirt collars and cuffs, which were dutiable at a compound rate of 30 cents per dozen plus 10 percent ad valorem, and shirts, on which the rate fixed in the Act is 45 percent ad valorem. The duty on certain specified items was reduced from 37½ percent to 20 percent, and the duty on shirt collars and cuffs was reduced to 16 cents per dozen plus 5 percent ad valorem, effective January 1, 1939, pursuant to trade agreement with the United Kingdom. All the articles covered by this report are subject to an additional duty of 10 cents per pound on cotton contained therein having a sample of 1½ inches or more in length, under paragraph 924 of the Tariff Act, but the amount of duty collected under this provision on wearing apparel is small.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	1 660,000	5,146	1 645,000	2 438	1 646,000	Percent 0.08

¹ Estimated.
² Landed value; foreign value was \$323,000.

Wearing apparel dutiable under paragraph 919 consists of articles, in chief value of cotton, made from woven materials and not ornamented with lace or embroidery. Domestic production includes men's and boys' clothing, such as shirts, work clothing, khaki and duck uniforms, and athletic underwear; women's clothing, such as dresses, slips, aprons, blouses, uniforms and kimonos; and children's clothing. Imports consist of cotton shirts, collars and cuffs, and a wide variety of other articles, among which are bathrobes, dresses, kimonos, pajamas, trousers and knickers, raincoats, and bow ties for dress wear. Imports are very small in comparison with production. They are of two sorts, consisting of high-priced specialties received principally from the United Kingdom, and low-priced articles from Japan, which are similar or inferior to the average of domestic production.

Domestic producers are equipped with machinery for manufacture in bulk, and this circumstance, together with the preferences which they have established for their products by the use of trade-marks and brand promotion, has operated, apart from the tariff, to prevent any serious competition from abroad.

Imports declined from \$1,091,000 in 1929 to \$160,000 in 1932, and then increased to \$726,000 in 1937. Imports in 1938 and 1939 again declined to between \$300,000 and \$400,000 a year, as the result both of less favorable business conditions in the United States, and increasing difficulties in the way of obtaining goods from Japan.

Statistics of the production of cotton wearing apparel are not reported separately except in 1933, when the value was 409 million dollars. On the basis of available information the production is

estimated at about 750 million dollars in 1929 and at 650 million in 1937. The estimated value in 1939 (550 million dollars) was less than in 1937, but greater than in most other census years since 1929.

Exports are small in ratio to production, but are many times greater than imports. Most of the exports are to Central and South American countries, Canada, and the Union of South Africa.

POST-WAR SHORT TERM

Because of the depletion of inventories during the war, and the need to re-outfit returning soldiers, consumption and production will probably be much greater than in 1939. The widespread need for clothing and the extreme shortage of supplies which will prevail in all foreign countries at the end of the war will probably leave only a very small quantity available for import into the United States.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Growing competition from rayon may offset the expansion in demand for cotton wearing apparel that might otherwise be expected from an increase in population. Therefore, the quantity of cotton wearing apparel produced may be no more than in 1939. An increase in value, however, is probable, because of the anticipated increase in the price of cotton cloth, usually the most important element in the cost of cotton wearing apparel. An increase of 10 to 15 percent in the average unit value of production may be assumed, in which case the total value of production for the domestic market might be 600-625 million dollars a year. This amount probably would not be changed appreciably by a decrease or increase of 50 percent in the duty. As imports and exports are small, production would be approximately the same as consumption.

Duty as in 1939.—Imports, like production, might be no greater in quantity than in 1939, but might average 10-15 percent higher in value. Under these circumstances the total foreign value of imports would be \$340,000 to \$360,000 a year. The landed value of the imports would then account for about one-tenth of 1 percent of the value of consumption, as in 1939.

Duty reduced by 50 percent.—Imports might be two or three times greater than with an unchanged duty, because of the lower prices at which they could be sold; they might have a foreign value of 0.7-1.1 million dollars a year.

Duty increased by 50 percent.—Imports would probably be restricted to fine-quality and specialty goods. The total foreign value might be \$150,000 to \$250,000 a year, or 30 to 60 percent less than if the duty were unchanged.

Per capita income 75 percent higher than in 1939.

Prices might be about 15 percent higher, and the quantity of consumption 15 to 20 percent greater than if per capita income were the same as in 1939. The value of production for the domestic market would then be 800-850 million dollars a year. This amount would probably not be affected to any appreciable extent by a decrease or an increase of 50 percent in the duty. Because of the greatly increased

demand for higher priced articles and luxuries, imports might be considerably greater than if per capita income were unchanged. In the estimates which follow it has been assumed that imports would be two to four times as great (depending on the rate of duty), as previously estimated with per capita income the same as in 1939.

Duty as in 1939.—Imports might have a foreign value of 0.9–1.2 million dollars, and a landed value of 1.2–1.6 million dollars a year.

Duty reduced by 50 percent.—Imports might have a foreign value of 1.5–2.1 million dollars and a landed value of 1.8–2.6 million dollars a year.

Duty increased by 50 percent.—Imports might have a foreign value of \$650,000 to \$950,000 and a landed value of \$975,000 to \$1,425,000 a year.

Exports

Until foreign production has been restored and the most acute needs abroad satisfied, exports will probably be large. Thereafter they might be in the range of 4–7 million dollars a year, depending on international trade policies and on the level of world income.

Employment

No separate enumeration is reported by the Census Bureau of the number of employees engaged in the production of cotton wearing apparel. It is probable that employment will vary approximately with the quantity of production.

NOTTINGHAM LACE-CURTAIN MACHINE MANUFACTURES

Tariff paragraph: 920.

Commodity: Fabrics or articles, wholly or in chief value of cotton or other vegetable fiber, made on the Nottingham lace-curtain machine.

Rate of duty: 50% ad val.

Note.—The rate fixed in the Tariff Act of 1930 was 60 percent ad valorem, which was reduced to 50 percent, effective January 1, 1939, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	12,270	¹ 50	12,220	² 250	12,570	Percent 2.6
Persons employed (number).....	¹ 3,000					

¹ Estimated.

² Landed value; foreign value was \$222,000.

The 500 Nottingham lace-curtain machines¹ in the United States, all imported from England, are normally used chiefly in the production of window curtains and curtain nets, with a smaller production of

¹ These huge machines, the largest used in lace making, cost thousands of dollars apiece and range in width up to 490 inches and in weight up to 16 tons. About four-fifths of them are in Pennsylvania, the others in New York and Illinois.

articles such as lace bedspreads, pillow shams, valances, and table covers. During the war most of the machines have been utilized in the production of mosquito, insect, and camouflage nettings for the armed forces.

The number of Nottingham lace-curtain machines in the world in 1939 appears to have totaled only about 2,200, including some 800 in the United Kingdom, 500 in the United States, 500 in Germany, 200 in other European countries, and 200 (including 86 in Japan) in all other countries.

The small imports are mainly novelties, including relatively few curtains and being mostly upholstery articles such as lace table covers and runners, chair-arm and back covers, scarfs, and napkins. These imports are almost wholly from the United Kingdom.

The main competitor of the domestic lace curtain is the domestic woven curtain.

Nottingham lace curtains, dinner cloths, etc., are luxury, or semi-luxury, goods and therefore subject to the vagaries of fashion. Following World War I the building boom and its attendant increase in the demand for window draperies and other upholstery articles, together with a high national income, resulted in a revival of the fashion for lace curtains; the ensuing 5 years were the best ever experienced by the industry. In 1923 production reached the record height of more than 23 million dollars; imports (subject to duty of 60 percent ad valorem or more) were \$92,000 (foreign value), and exports, \$97,000. Subsequently, production declined to a lower level because of the increase in competition from domestic woven curtains, including many new kinds. There was a sharp drop during the depression and the subsequent recovery did not carry through to previous heights. The fluctuations in demand for Nottingham lace-curtain machine products are roughly indicated by the value of their output in million dollars as follows: 5.9 in 1914, 15.8 in 1919, 23.3 in 1923, 8.7 in 1931, 15.8 in 1937, and 13.3 in 1939.

In only 2 years (1936 and 1937) during the past 50 years have the foreign values of imports exceeded \$300,000, and in the depression year 1931 the foreign value was less than \$17,000. Imports rarely have exceeded 3 percent of domestic consumption. At their peak in 1937 imports had a landed value of about \$1,215,000 (foreign value of \$725,000 plus 60 percent duty and 7½ percent landing charges) and this was equal to about 7 percent of domestic consumption (domestic production being valued at 15.8 million dollars).

POST-WAR SHORT TERM

During World War II the output of Nottingham lace-curtain machine products for civilian use has been greatly curtailed; most of the machines have been making mosquito, insect, and camouflage nettings for the armed forces, and it has been difficult to get yarn for use in making civilian goods. After the war there will be more houses, with more windows and more furniture, and therefore more need for curtains and upholstery fabrics than in 1939. The competition from woven curtains will probably be less than normal because of the great demand for woven fabrics for more essential uses. These factors combined should ensure to the domestic Nottingham lace-curtain industry a demand for all the goods it can produce, particularly

if national income continues near to wartime levels. This output may be estimated at 40-50 percent more than the output in 1939.

Imports of Nottingham lace-curtain machine products may approach the 1937 peak and therefore be at least three times as high as in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The nation will be better housed and therefore will need more curtains, tablecloths, bedspreads, and other upholstery fabrics per capita than ever before. However, if the per capita income drops back to that of 1939, the probable tendency will be to use woven fabrics instead of the higher-priced lace fabrics, and (despite increase in population) the consumption of Nottingham lace-curtain machine products may be little, if any, higher than in 1939, when it was valued at 13.6 million dollars.

Duty as in 1939.—Assuming strong competition from woven goods, the foreign value of imports might amount to from \$200,000 to \$250,000, approximately the same as in 1939, and representing about the same small proportion of consumption as in that year.

Duty reduced by 50 percent.—Such a reduction probably would cause a sharp increase in imports and a decrease in production. Imports might advance ten- to twelve-fold, say from the pre-war 2-3 percent of consumption to as high as 20-30 percent of consumption and might amount to 2-3 million dollars (foreign value) a year. If, as heretofore, the United Kingdom remains the only important source, and the American designers continue to cater to the fluctuating style demands of the American public more closely than can those abroad, it does not appear probable that the imports would exceed the percentages above stated. With imports at such figures, however, domestic production would probably decrease to between 9 and 11 million dollars.

Duty increased 50 percent.—Such an increase in duty would probably curtail imports and confine them to the highest-class specialties, of which the foreign value might be \$100,000-\$125,000 a year, or about one-half as great as in 1939. The restriction of imports to this degree would have only slight effect on domestic production which has usually supplied all but 2-3 percent of domestic consumption.

Per capita income 75 percent higher than in 1939.

Nottingham lace-curtain machine products are luxury, or at least semiluxury, articles, so that with such a per capita income and an increase in population there would probably be at least a 50-percent increase in their consumption, say, to 20 million dollars, in spite of the competition of woven articles.

Duty as in 1939.—If the duty remained unchanged, it is probable that imports, because they are mostly luxury specialties, would increase to 3-4 percent of consumption, and become \$400,000-\$500,000 (foreign value) a year. The rest of consumption amounting to 19-20 million a year would be supplied by domestic production.

Duty reduced by 50 percent.—Imports would undoubtedly show a large increase, possibly becoming 20-30 percent of consumption,

amounting to from 3-4 million dollars (foreign value). Because of the increased consumption, however, production would probably be greater than in 1939, amounting to perhaps 16-17 million dollars.

Duty increased by 50 percent.—Such an increase might curtail imports and confine them to the highest-class specialties, but would probably change but slightly the 1939 ratio of imports to consumption (2.6 percent). In that case the foreign value of imports would amount to between \$300,000 and \$400,000 a year.

Exports

Exports of Nottingham lace-curtains are not separately shown in United States trade statistics, but they are known to be much less than \$100,000.

Employment

Employees in 1939 have been estimated, on the basis of six per machine in place, at 3,000. Little change is expected in the number of machines in place, but under the assumptions made above the number in operation will vary; and this might result in the number of employees ranging from 2,500 to 3,500.†

COTTON FLOOR COVERINGS

Tariff paragraph: 921.

Commodity: Cotton floor coverings.

Rates of duty: 20%, 35%, 40%, or 75% *Equivalent ad valorem (1939):* 28% ad val.

NOTE.—The rates fixed in the Tariff Act of 1930 were 75 percent ad valorem on hit-and-miss rag rugs, 40 percent on chenille rugs, and 35 percent on all other cotton floor coverings.

To safeguard the maintenance of cotton rug manufacturing codes under the National Industrial Recovery Act the President, under the authority of section 3 (e) of that Act, ordered the imposition of fees on imports of cotton rugs, as follows: On imitation orientals, 23 cents per square yard; on chenille rugs, 15 cents per square yard; and on other, except grass, rice-straw, and hit-and-miss rag rugs, 20 percent ad valorem but not less than 5 cents per square yard. The fees on imitation orientals became effective June 10, 1934, and the other fees became effective June 5 of that year. All fees remained effective until June 15, 1935, when they were discontinued because of invalidation of the N. I. R. A. by the Supreme Court. The Tariff Act duty of 35 percent on imitation orientals was reduced to 20 percent, effective May 1, 1935, pursuant to trade agreement with Belgium, but the import fee was retained until eliminated as above stated.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production †	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 square yards).....	‡ 3,000	12,459	‡ 15,459	Percent 81
Value (\$1,000).....	‡ 3,750	‡ 4,440		
Unit value (per square yard).....	‡ \$1.25	\$0.36		
Persons employed.....	(§)			

† No exports reported.

‡ Estimated.

§ Foreign value.

¶ Not available.

Cotton floor coverings, almost all of which are rugs, include types differing widely in quality and price. Chenille rugs predominate in domestic production, accounting for more than half the total yardage,

and are followed by rag rugs (hit-and-miss and other), oval braided rugs, hooked rugs, and tufted rugs. Imports in 1939 were mainly cotton imitation oriental rugs, cotton rag rugs (including the hit-and-miss and other types), rice-straw and cotton or grass and cotton rugs (in chief value of cotton), sanshu-yarn rugs (in which the filling is made of cotton shoddy), and hooked rugs.

Imitation oriental rugs are woven on power looms only; chenille rugs are usually woven on power looms in the United States and on hand looms in Japan; rag rugs are woven, in the United States as well as in Japan, on both hand and power looms, with the hand loom predominating in both countries; sanshu-yarn rugs are woven on hand looms in Japan. Oval braided rugs are made by braiding and sewing; tufted rugs are made by a heavy sewing machine which forces the pile yarn through a cotton duck foundation; hooked rugs are made by hand, using a small hand punch or an electrically operated needle.

The types averaging highest in price per square yard are the tufted rugs and the hooked rugs, followed by chenille rugs, imitation oriental rugs, and plaid rag rugs; the lowest priced types are the Japanese sanshu-yarn rugs and hit-and-miss rag rugs.

United States production of cotton rugs as a whole can only be estimated. Census reports, relating only to factory production, showed cotton rugs produced in 1939 as 2,223,706 square yards valued at \$2,968,706, plus an unrecorded quantity sold at \$495,482, from which the total factory output may be estimated at about 2,600,000 square yards with a total value of \$3,464,188. In addition there is a substantial production of cotton rag rugs on hand looms in private homes, and in institutions for the blind, for which no data are available. Including both factory and home production, the United States output of cotton rugs in 1939 may be roughly estimated at about 3 million square yards (valued at \$3,750,000), consisting of some 2 million square yards of chenille rugs, 400,000 square yards of hit-and-miss rag rugs, and 600,000 square yards of all other cotton floor coverings.

United States imports of cotton rugs as recorded in 1939, and their relative importance in the total estimated consumption, are shown below:

Cotton floor coverings	Imports				Ratio of imports to consumption (quantity)
	Quantity	Value	Unit value	Rate of duty	
	<i>Sq. yds.</i>		<i>Per sq. yd.</i>	<i>Percent</i>	<i>Percent</i>
Imitation oriental rugs.....	3,921,549	\$2,545,759	\$0.65	20	100
Rice-straw or grass rugs ¹	2,870,305	243,750	.08	35	100
Chenille rugs.....	312,478	105,047	.34	40	14
Hit-and-miss rag rugs.....	1,522,004	129,867	.08	75	80
Other cotton floor coverings.....	3,832,301	1,415,288	.37	35	86
Total.....	12,458,637	4,439,711	.36	27.7	81

¹ Cotton chief value.

Imports of cotton imitation oriental rugs were mainly from Belgium, with some from Italy and France; imports of rice-straw or grass rugs, chenille rugs, and hit-and-miss rag rugs were almost wholly from Japan; the bulk of the imports listed as "all other" (including sanshu-yarn rugs, plaid rag rugs, hooked rugs, braided rugs, and various other

types) were from Japan, with smaller amounts from Belgium, Italy, Canada, and other countries. Of the total quantity of cotton rugs imported in 1939, Japan supplied 57 percent and Belgium 37 percent; of the total value, however, Belgium accounted for 69 percent and Japan only 21 percent. Italy and France supplied most of the small remainder. The cotton rugs supplied by Japan averaged only 12.6 cents per square yard while those supplied by Belgium averaged 67.1 cents per square yard (foreign values).

POST-WAR SHORT TERM

The available supply, and therefore the consumption, of cotton rugs will probably be substantially lower than it was in 1939. If it is assumed that Japan will not be an important exporter in the immediate post-war period, consumption may be less than half of the 1939 total. During the war it has been difficult to get sufficient yarn for the domestic production of cotton rugs, and early in 1945 the sale of cotton yarn to home weavers was prohibited. Immediately after the war, with adequate supplies of cotton yarn again available, domestic production of cotton rugs will probably exceed the production in 1939 by a considerable margin.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of cotton floor coverings would be materially affected by a 50-percent change in the duties and might be in the range of about 16-22 million square yards. With a 50-percent decrease in the duties the consumption would probably approach the higher figure and with a 50-percent increase in duties it would approach the lower.

Duty as in 1939.—Assuming a 10-percent increase in population and a 20-percent increase in prices or unit values above those of 1939, imports would be about 13.8 million square yards, with a foreign value of 5.9 million dollars, and production would be about 3.3 million square yards, valued at 4 million dollars.

Duty reduced by 50 percent.—The quantity of imports would probably be about 50 percent more than with no change in duties but unit prices might average about the same. In such case, imports would be about 20.7 million square yards, with a foreign value of 8.9 million dollars. Domestic production would probably consist almost entirely of "all chenille" chenille rugs, and of high-priced tufted rugs, which are not made abroad, and be reduced to about 1 million square yards, valued at 1½ million dollars.

Duty increased by 50 percent.—Imports might drop to about 60 percent of the quantity estimated for imports with duty unchanged, but without appreciable change in average unit values. Imports would then be about 8.3 million square yards, with a foreign value of 3.6 million dollars. The increase in duty would not be sufficient to revive the domestic manufacture of cotton imitation oriental rugs or the manufacture of wire-grass rugs (both of which have ceased to exist) but would probably stimulate the production of chenille rugs, rag rugs, and possibly hooked rugs. Under these circumstances domestic cotton rugs might supply half, in quantity, of the domestic demand and be 8.3 million square yards, valued at about 12.5 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of cotton floor coverings at this higher income level would probably total about 20-28 million square yards, or about 25 percent higher than with no change of income.

Duty as in 1939.—Assuming for both imports and production an increase of about 20 percent in quantity and about 10 percent in average unit price, above those estimated as obtaining with per capita income the same as in 1939, imports would be about 16.6 million square yards, with a foreign value of about 8 million dollars, and production would be about 4 million square yards, valued at 6.6 million dollars.

Duty reduced by 50 percent.—The quantity of imports would probably be about 50 percent more, but unit prices might be about the same as estimated for the same level of income and unchanged duties. Imports would then be about 25 million square yards with a foreign value of about 11.8 million dollars. Production might be about 3.3 million square yards, valued at 5.5 million dollars.

Duty increased by 50 percent.—Imports might drop about a third in quantity from that estimated for the same level of income and unchanged duties. Assuming no change in average unit prices, imports would be about 11.1 million square yards with a total foreign value of 5.2 million dollars. Production might be about 9 million square yards, valued at 15 million dollars.

Exports

United States exports of cotton floor coverings have been negligible in the past and are likely to be negligible in the post-war period.

Employment

Data are not available on employment in the domestic production of cotton floor coverings.

COTTON RAGS, EXCEPT PAPER STOCK

Tariff paragraph: 922.

Commodity: Rags, including wiping rags, wholly or in chief value of cotton, except rags chiefly used in paper making.

Rate of duty: 2¢ per lb.

Equivalent ad valorem (1939): 48%

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item (wiping rags only)	Production for domestic market	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (million pounds).....	1.09	8	1.09	Percent
Value (million dollars).....	10.5	8.6		
Unit value (per pound).....	\$9.11	\$9.67		

¹ Estimated.
² Foreign value.

Imports in 1939 were abnormally low; production, on the other hand, was somewhat above normal, with the result that consumption was only slightly above a normal pre-war figure. The period 1931-38 is considered more representative of the pre-war situation and is used as a basis for the discussion which follows. Average United States production, imports, and consumption for 1931-38, are shown in the tabulation below:

Item (wiping rags only)	Production for domestic market	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (million pounds).....	175	20	195	Percent 21
Value (million dollars).....	17.2	10.9		
Unit value (per pound).....	\$0.10	\$0.05		

¹ Estimated.
² Foreign value.

The rags covered in paragraph 922 include wiping rags and rags for remanufacture (except rags chiefly used in paper making).¹ In the pre-war period virtually all of the imports under this paragraph were wiping rags.

The United States also exports cotton rags, but in the past most of the exports have been quite different from the types imported. The exports have been predominantly rags intended for remanufacture into cotton shoddy; these rags, because small, would not generally be suitable for wiping purposes. Principally for the foregoing reasons, this report covers only wiping rags; the statistics shown in the above summary table, including those on domestic production, are for this class only of cotton rags.

Wiping rags consist principally of pieces of cloth torn or cut from used clothing, such as skirts, slips, kimonos, knit underwear, etc. When supplies of reclaimed materials are inadequate, however, new goods are made into wiping cloths.

The collection of rags in the United States is generally carried out in conjunction with the gathering of waste paper, junk, and other classes of salvaged articles. Only part of the rags which are collected and sorted are of cotton, and only part of these are suitable for wiping purposes. The output of such rags varies not only with the frequency with which people discard their wearing apparel, but more particularly with the thoroughness with which rags are collected, sorted, and processed. The level of the national income and the prices offered for rags, therefore, have important effects on the quantities collected.

The demand for wiping rags varies closely with the level of industrial activity. The higher the per capita income the greater the industrial activity and consequently the greater the demand; but under conditions of high national income (despite the greater frequency with which people might discard their used wearing apparel), collection of

¹ Rags for remanufacture include rags (except paper stock) too small for wiping purposes but suitable for the reclamation of the fiber. Fibers are reclaimed by passing rags through picking or garnetting machines which reduce them to a fibrous mass called cotton shoddy. This material is used as bedding or wadding for mattresses, roofing felts, journal packing, and calking cotton; some is respun into yarn for use in mops and in coarse fabrics.

rag might not offer sufficient remuneration to induce greatly increased collections. In these circumstances a substantial part of the consumption of wiping rags might be supplied by new goods, manufactured especially for the purpose, or salvaged from rejects of articles intended for other purposes. Increased imports presumably could not make up much of the deficiency, because foreign countries would also be confronted with conditions similar to those prevailing in the United States.

Changes in tariffs, principally through their influence on price, would no doubt have important effects on the volume of imports and, to some extent, on the volume of consumption of wiping rags. The level of tariffs might also have some small effect on exports of cotton rags.

POST-WAR SHORT TERM

Cotton wiping rags, in extraordinary demand during the war, will probably continue to be in great, though somewhat reduced, demand for several years after hostilities cease. Wiping rags will be needed in substantial quantities, both at home and abroad, as wartime industries reconvert to peacetime production. Consumption might then be 2 to 2½ times as great as the average in the period 1931-38. Part of this consumption might have to be supplied by new goods, since it is doubtful whether the salvage of old rags in this country, together with imports, would be sufficient to meet the demand. Imports will probably be smaller than in the pre-war period, inasmuch as Japan and the other countries which formerly supplied the United States not only will have a lessened output, but also will no doubt require all of their output for home use.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Because of increase in population, consumption of cotton wiping rags would likely be 10 to 15 percent higher than the average for the period 1931-38, or about 105-115 million pounds, depending in part on the rate of duty. Under unchanged duties, unit prices might be about the same as their average in the period 1931-38. Changes in tariffs would affect both domestic and foreign prices, but probably the domestic more than the foreign.

Duty as in 1939.—Total consumption would probably amount to about 110 million pounds. Imports would probably supply about 23 million pounds, with a foreign value of about 1 million dollars, and domestic production about 87 million pounds, valued at about 8.7 million dollars.

Duty reduced by 50 percent.—Consumption would probably amount to about 113 million pounds, of which imports would probably supply about 31 million pounds, with a foreign value of about 1.6 million dollars and domestic production about 82 million pounds, valued at about 7.4 million dollars.

Duty increased by 50 percent.—Consumption might be about 107 million pounds, of which imports would supply about 16 million pounds, with a foreign value of about \$600,000, and domestic production about 91 million pounds, with a value of about 10 million dollars.

Per capita income 75 percent higher than in 1939.

Because of the higher industrial activity that might be expected at this level of income, domestic consumption of cotton wiping rags might well be 30 to 40 percent larger than with per capita income at the 1939 level. Unit values of both imports and production might, in the absence of tariff changes, be 20 to 30 percent higher than at the lower income level. Higher prices would result principally from the need to supply a larger fraction of consumption with new goods, and from the necessity of meeting higher costs of collection, sorting, and processing of old rags. Changes in tariffs would affect both foreign and domestic prices, but probably domestic prices somewhat more than foreign.

Duty as in 1939.—Consumption would probably total 150 million pounds, of which imports would supply about 30 million pounds, with a foreign value of about 1.7 million dollars, and domestic production about 120 million pounds, with a value of nearly 15 million dollars.

Duty reduced by 50 percent.—Total consumption might be about 155 million pounds, of which imports would supply about 41 million pounds, with a foreign value of about 2 million dollars, and domestic production about 114 million pounds, with a value of nearly 13 million dollars.

Duty increased by 50 percent.—Consumption would perhaps amount to 145 million pounds, of which imports would supply about 24 million pounds, with a foreign value of about 1 million dollars, and domestic production about 121 million pounds, with a value of about 16.7 million dollars.

Exports

Exports of cotton wiping rags are not separately reported but are known to be negligible.

Employment

No data are available concerning the total number of persons engaged in the collection and processing of cotton rags used for wiping purposes.

COTTON FISH NETS AND NETTING

Tarif paragraph: 923.

Commodity: Cotton fish nets and netting.

Rate of duty: 30% or 40% ad val. *Equivalent ad valorem (1939):* 30%.

NOTE.—The 30-percent rate indicated above applies to fishing nets valued at 50 cents or more per pound, and was reduced from 40 percent effective January 1, 1939, pursuant to the trade agreement with United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 3, 250	1 24	1 2, 476	778	1 5, 269	Percent 54
Value (\$1,000).....	1 2, 739	1 20	1 2, 720	1 199		
Unit value (per pound).....	\$2.10	\$2.20		\$0.257		
Persons employed (number).....	(*)					

1 Estimated.
 2 Foreign value.
 3 Estimated 300-400.

Cotton fish netting, used in virtually all commercial fishing areas of the United States, is made by bringing threads, twines, or cords together and knotting them at the intersections to form meshes. Netting is usually designated as "webbing" in order to distinguish it from completed nets ready for fishing. Its largest consumption in the United States is in the mackerel and sardine fisheries off the North Atlantic and South Pacific Coasts and in the menhaden fisheries off the Middle and South Atlantic Coasts. Some cotton netting is used in the Great Lakes and Mississippi River fisheries and by the salmon and tuna fisheries of the Pacific.

Consumption of fish nets and netting in the United States has been supplied chiefly by domestic production. Imports, however, contributed an increasing proportion of the total between 1934 and 1940. Domestic production of fish nets and seines, including those made of linen but consisting principally of cotton products, increased in value from 1.8 million dollars in 1933 to 3.5 million dollars in 1939. According to data supplied by manufacturers, the output of cotton fish nets and netting ranged from 1½ to 2½ million pounds annually in recent pre-war years. The relatively small imports of cotton fish nets and netting before 1932 came mainly from Europe. In 1932 Japan became the principal source; imports from that country increased from 120,000 pounds, with a foreign value of \$23,000, in 1932, to more than 800,000 pounds, with a foreign value of \$236,000, in 1937, but declined thereafter to 719,000 pounds, with a foreign value of \$170,000, in 1939 and 619,000 pounds, with a foreign value of \$190,000, in 1940. The annual average imports from Japan in the 4-year period 1936-39 were 640,000 pounds. The average price per pound of Japanese nets was considerably less than that of domestic manufacture as well as that of European origin.

Both domestic production and imports have varied considerably from year to year. Total consumption of fish nets probably will respond more readily to changes in the per capita level of income than to modification in the rates of duty; and in the estimates below the possible slight effect of duty changes on consumption is disregarded.

POST-WAR SHORT TERM

The consumption of cotton fish nets and netting will probably be confined largely to those of domestic manufacture inasmuch as Japan has supplied over 90 percent of the imports in recent years, and it seems unlikely that imports from that source would be revived in quantity, if at all, so soon after the close of hostilities. The output of other foreign producers, which include the United Kingdom, Netherlands, and Belgium, will be needed to supply their own as well as the requirements of other European consumers. Domestic production may expand somewhat to meet the needs of the home market.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption would probably be little greater than that in 1939 (about 3½ million pounds), which was somewhat higher than in other years during the immediate pre-war period. In line with an expected increase in the price of cotton above that of 1939, it is assumed that the price per pound of cotton fish netting would be \$1.20 for the domestic and about 30 cents for the foreign product. Probably neither production nor imports would change materially as to quantity, but they would be likely to show a small increase in value. Changes in duty by 50 percent would probably not affect consumption appreciably.

Duty as in 1939.—Production might be about the same as in 1939, or about 2½ million pounds, valued at about 3 million dollars. Imports might be about 775,000 pounds, with a foreign value of about \$230,000.

Duty reduced by 50 percent.—Imports would probably be stimulated and might amount to about 900,000 pounds, with a foreign value of about \$270,000. Production might decline to about 2.4 million pounds, valued at about 2.8 million dollars.

Duty increased by 50 percent.—Such an increase might result in diminishing imports to somewhat less than in 1939, whereas production might increase. Of the domestic consumption, production would probably supply nearly 2.6 million pounds, valued at nearly 3.1 million dollars, and imports about 700,000 pounds, with a foreign value of about \$210,000.

Per capita income 75 percent higher than in 1939.

At the higher level of income, an increase in the per capita consumption of fish would probably result in a greater demand for fish nets and netting. Total consumption of nets and netting might be 20 percent higher than under the 1939 income level, or 3.9 million pounds, and would probably be affected but little by a change of 50 percent in the duties in either direction. Prices would probably move with the general price level and increase by 10 to 15 percent.

Duty as in 1939.—Production might increase by about 20 percent over the 1939 level, or to about 3 million pounds, valued at about 4 million dollars. Imports would probably amount to about 900,000 pounds, with a foreign value of approximately \$360,000.

Duty reduced by 50 percent.—Imports might be slightly more than 1 million pounds, with a foreign value of about \$420,000. Production might amount to perhaps 2.9 million pounds, valued at about 3.9 million dollars.

Duty increased by 50 percent.—Imports might amount to nearly 800,000 pounds, with a foreign value of about \$320,000. Production would probably increase to about 3.1 million pounds, valued at nearly 4.2 million dollars.

Exports

United States exports of cotton fish nets and netting, not separately recorded, have been small, probably amounting to less than 30,000 pounds annually in recent years. Canada has been the principal market. In view of earlier trends in world production, United States exports are not likely to assume a more important position than in the past.

Employment

The number of persons employed in the manufacture of fish nets and seines was reported as 475 in 1935 and 500 in 1937. Since cotton fish nets and netting represent from 80 to 90 percent of the total, the number employed are estimated to have been 350 to 400 persons. Assuming per capita income at a level equal to that of 1939, the number employed would probably remain about the same. At a level of income 75 percent greater than in 1939, employment might increase by 10 to 20 percent, or to, say, 400 to 500 persons.

SCHEDULE 10. FLAX, HEMP, JUTE, AND MANUFACTURES, AND RELATED ITEMS PROVIDED FOR IN THE FREE LIST

INTRODUCTION AND SUMMARY

All items dutiable under schedule 10 of which the imports in 1939 exceeded \$100,000 are covered in this section, with the exception of flax manufactures not specially provided for (falling under paragraph 1023), of which the imports in 1939 were valued at \$642,939. Because of the highly miscellaneous character of these imports, no report has been prepared on this particular classification.

The total number of dutiable items reported under schedule 10 is 17. The more important of these, as measured by imports, are burlap, and a second group comprising chiefly fine linen fabrics, table damask, and napkins. Very little of either of these categories of items is produced in the United States. These two items alone accounted for about three-fourths of the 1939 imports of dutiable items in this schedule. As measured by production, other important items in the dutiable list are linoleum and felt-base floor-coverings (included in one section) and jute bags, followed (at a considerably lower level) by hard-fiber rope; linen handkerchiefs; flax and hemp yarns, threads and twines; coarse linens and linen towels, and various smaller items. The value of the imports of these 17 dutiable items in 1939 was 54.3 million dollars, compared with total value of about 55.5 million for imports of all items under the schedule.

In addition to the dutiable items, 11 related duty-free items are described; they include major commodities such as sisal and henequen, manila (abacá) fiber, jute fiber, and binding twine. The total value of the imports of these 11 duty-free items in 1939 was 21.2 million dollars.

Estimates of post-war production (for the domestic market) and imports of the 28 dutiable and free items have been totaled. In the following tabulation these total estimates are compared with actual production and imports in 1939:

Period, income level, and tariff treatment	Production for the domestic market		Imports	
	Value	Ratio to 1939	Foreign value	Ratio to 1939
<i>Flax, hemp, jute, and manufactures, dutiable items</i>				
1939	157.5	100	54.3	100
Post-war long term:				
Per capita national income same as in 1939:				
Duty as in 1939	174.4	111	57.1	105
Duty reduced by 50 percent	166.1	105	62.2	115
Duty increased by 50 percent	178.6	112	54.5	100
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939	266.8	169	108.1	199
Duty reduced by 50 percent	256.4	163	117.7	217
Duty increased by 50 percent	267.8	170	104.3	192
<i>Flax, hemp, jute, and manufactures, related free items</i>				
1939	6.8	100	21.2	100
Post-war long term:				
Per capita national income as in 1939	8.1	120	30.0	141
Per capita national income 75 percent higher than in 1939	9.5	141	44.0	207

In 1939 the production (for the domestic market) of the 17 classes of items in the dutiable list covered by this group of reports was valued at 157.5 million dollars, and the imports of such items at 54.2 million dollars, imports being equal to about 34 percent of production. There is, of course, some duplication in the statistics of domestic production, but not enough to affect the comparison materially. The production of the 11 related free items was valued at 6.8 million dollars, and the imports at 21.2 million dollars, imports being more than three times the domestic production.

The over-all figures for this schedule are heavily weighted by the circumstance that items which predominate in the imports are produced either in small quantities or not at all in the United States, whereas items which tend to predominate in domestic production are not imported in great quantities. Partly as a result of this circumstance, the over-all figures do not show large differences in the ratios of imports to production under the several assumptions as to duties. The differences in these ratios naturally tend to be greater for individual items.

Assuming national income at the 1939 level, the value of domestic production of dutiable items in the long-term period is estimated to increase above that in 1939 about in proportion to the assumed 10 percent increase in population. On duty-free items the estimated increase in production is at a somewhat greater rate (20 percent). For dutiable imports, the estimated rate of increase over 1939 ranges from zero at the high-duty level to 15 percent at the low-duty level. Imports of free-list items are estimated to increase by 41 percent.

Assuming per capita national income 75 percent higher than in 1939, the estimated value of production of items in the dutiable list ranges

from 63 to 70 percent higher than in 1939 (depending on the assumption as to rate of duty on imports), and the estimated value of free items is 41 percent higher. The increases over 1939 for imports of dutiable items range from 92 to 117 percent; for free items, the increase is 107 percent. A part of these increases in value of production and imports under the higher income level is, of course, due to assumed higher prices.

It will be noted that, at either assumed level of national income, the total imports of dutiable items do not vary widely from each other under the several assumptions as to rate of duty. In considerable measure this is attributable to the fact that, at a given level of national income, imports of one highly important item, burlap, are estimated to be the same regardless of the assumed rate of duty, the rate of duty on burlap being low and all the domestic requirements being imported in any case.

As pointed out in the general introduction, the summary estimates in the above table are subject to an appreciable margin of error, notwithstanding the tendency of errors in the estimates for the individual items to offset one another. The fact that two items (burlap, and fine linens, etc.) account for three-fourths of the dutiable imports, and that two other items (linoleum and felt-base floor coverings, and jute bags) account for two-thirds of the production of items in the dutiable list, may limit the effectiveness of such offsetting of errors. It is quite possible, however, that the errors with respect to these four items would largely offset each other.

FLAX

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939) (Average)
1001	Flax, unmanufactured:		
	Hacked.....	1½¢ per lb.....	} 4%
	Not hacked.....	¾¢ per lb.....	
	Noils and tow.....	½¢ per lb.....	

NOTE.—The rates imposed under the Tariff Act of 1930 were twice those indicated above and were reduced pursuant to the trade agreements with Belgium, effective May 1, 1935, and the United Kingdom, effective January 1, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds).....	1 939	13, 096	14, 025	Percent 93
Value (\$1,000).....	151	2, 984		
Unit value (per pound).....	\$0. 16	\$0. 21		
Persons employed (number).....	1 100			

1 Dressed line and tow only. There are no reported exports.
 2 Foreign value.
 3 Estimated.

United States production of flax fiber (as distinguished from production of flax for seed, which is a separate and much more important branch of the domestic flax-growing industry) is concentrated largely in the State of Oregon.¹ Principal sources of flax fiber imports in 1939 were Belgium, the Netherlands, and the Soviet Union. Since 1940, imports have averaged about 9.5 million pounds annually; about half originated in South America (chiefly Peru, Chile, and Argentina) and one-fifth in Canada.

Most of the United States production and imports of flax are used in making twines (mattress, broom, and sail twine) and threads (sewing and shoe thread). About one-fourth of the total consumption is in coarse toweling. Flax is of relatively minor importance in the United States textile industry, because consumption of linen products consists principally of fabrics such as table linen, doilies, towels, handkerchiefs, suiting, embroidery, and decorative materials, which have been supplied very largely by imports from textile-manufacturing countries of western Europe. United States flax in general has not been suitable for the production of fine yarn; hence it has been used only in the coarser types of these products. During the war, cotton has been substituted for flax in many uses.

As the result of high prices for flax and Government assistance, additional flax-processing plants have been built in the United States during the war. It is now possible to produce domestically several times as much flax fiber as before the war.

POST-WAR SHORT TERM

Consumption of flax fiber probably will be relatively high because of a large backlog of requirements for shoe thread, mattress twine, etc., as well as for crash toweling and possibly some coarse decorative fabrics. It appears likely that United States flax production, which in 1942 was about four times as large as in 1939, will continue to be larger, at least for the immediate post-war years, than it was before the war. Imports might be from 50 to 100 percent larger than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Unless the substantial Government support given to this industry during the war emergency is continued after the war, production of flax fiber will probably be at about the pre-war level, or at most only moderately higher, say, 1.0-2.5 million pounds, and the relation between imports and domestic production is likely to be that which prevailed before the war.

The duties on flax fiber are very low (equivalent to about 4 percent ad valorem), and a 50-percent change in either direction would have little effect on imports. A 50-percent decrease in the duties on fabrics and articles of flax, however, would probably result in a substantial increase in imports of those products and a substantial decrease in the imports of fiber. A 50-percent increase in duties would have the opposite effect.

¹ Regarding use, for cigarette paper, of fiber which is a byproduct of the flaxseed industry, see p. 1288.

Per capita income at 1939 level.

Average unit values might remain about the same as in 1939 if consumption of flax continues in the same uses as before the war. The average unit value of domestic production might then be about 16 cents per pound and the average foreign value of imports 21 cents per pound.

Duties as in 1939.—Taking account of increase in population, consumption of flax fiber might be about 10 percent higher than in 1939, or about 15.5 million pounds, of which domestic production might supply about 1.5 million pounds, valued at about \$240,000, and imports might then be about 14 million pounds, with a foreign value of about 2.9 million dollars.

Duties reduced by 50 percent.—As already indicated, a general lowering of duties would probably result in considerably larger imports of flax products and smaller imports of fiber. Consumption of flax fiber might then be in the neighborhood of 8 million pounds, with imports supplying about 7.2 million pounds, valued at about 1.5 million dollars (foreign value), and production approximately 800,000 pounds, valued at about \$128,000.

Duties increased by 50 percent.—Imports of flax products would probably decrease substantially and imports of fiber increase. Consumption of flax fiber might be about 20 million pounds and imports might be 18 million pounds, with a foreign value of 3.8 million dollars. Domestic production might then supply about 2 million pounds, valued at \$320,000.

Per capita income 75 percent higher than in 1939.

A larger consumption of flax products could reasonably be expected than at the lower income level, but it would probably be supplied to a considerable extent by the finer grades of linen goods which are normally provided by imports. Moderate increases might occur also in the consumption of flax fiber in the United States, owing to larger use of shoe thread and other types of linen threads as well as of crash towelings and coarse decorative fabrics. Consumption might be 25 percent above the amounts estimated for per capita income at the 1939 level.

Average unit values of production and imports might exceed those in 1939 to about the same extent as the increase in the general price level, or 10–15 percent. The average unit value of domestic production might be about 18 cents per pound and the average foreign unit value of imports about 24 cents per pound.

Duties as in 1939.—Consumption might be about 20 million pounds, of which domestic production might supply 2 million pounds, with a value of \$360,000, and imports 18 million pounds, with a foreign value of 4.3 million dollars.

Duties reduced by 50 percent.—Consumption might fall to about 10 million pounds, of which imports might supply about 9 million pounds, with a foreign value of about 2.2 million dollars and production might then be 1.0 million pounds, valued at \$180,000.

Duties increased by 50 percent.—Consumption might rise to 25 million pounds, of which imports might supply 22.5 million pounds with a foreign value of 5.4 million dollars. This level would indicate a domestic production of 2.5 million pounds, valued at \$450,000.

Exports

United States exports of flax fiber have always been negligible and will probably continue to be.

Employment

Post-war employment in the growing and processing of flax fiber might vary, depending on the level of national income and of rates of duty, from 100 to 200.

HEMP

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1001	Hemp (<i>Cannabis sativa</i>), unmanufactured:		
	Hemp and hemp tow-----	2¢ per lb-----	} 16%
	Hackled hemp-----	3¼¢ per lb-----	

NOTE.—The rates shown above are those imposed by the Tariff Act of 1930. They were reduced by 50 percent pursuant to the trade agreement with Peru, effective July 29, 1942.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds)-----	1,320	1,519	2,839	Percent 54
Value (\$1,000)-----	190	213		
Unit value (per pound)-----	\$0.14	\$0.14		
Persons employed (number)-----	2100			

¹ No exports are reported.

² Foreign value.

³ Estimated.

Hemp, a bast or soft fiber, is used in many of the same manufactures (shoe thread, broom twine, and so on) as flax and, to a much greater extent than flax, in tarred marine products such as marline, hambroline, and oakum. In the past, hemp, whether imported or domestic, has been at a disadvantage in the United States in competing with flax, because it was more difficult and costly to process. But recent research relative to the retting and scutching of hemp shows promise of considerable improvement in the processing qualities of hemp fiber, and, if these developments should materialize in the post-war period, the competition of hemp with flax might be considerably more effective.

World production of hemp in 1938 was about 950 million pounds, most of which was consumed in the producing countries, principally the Soviet Union, Italy, and the Southeastern European countries, and Chile. World exports were about 150 million pounds and originated principally in Italy and Chile. Before 1940, United States hemp imports originated chiefly in Italy; since 1940, Chile has been the chief source.

United States production of hemp in 1939, about 1.3 million pounds (from an estimated total of 3,000 acres planted for fiber), was about

the same as the average for the preceding 3 years. When the United States entered the war, the shortage of cordage fiber required a greatly increased production of hemp. As part of the wartime hemp program, 42 Government-owned hemp mills were built, each of which was designed to process the output of 4,000 acres of hemp. With the 1943-44 crop, production reached a high point of about 100 million pounds (line and tow). As other fibers became available, however, the hemp program was curtailed to about 50 million pounds for 1944-45.

Virtually all of the added wartime hemp production was used with hard fiber in the production of cordage. Indications are that this use will be discontinued after the war, because it adds considerably to the cost of the cordage and lowers the quality.

POST-WAR SHORT TERM

Production of hemp in the United States immediately after the war will depend largely on the disposition of the Government-owned hemp mills. Probably some of these mills will be available for processing hemp, with the result that production of the fiber for a year or two after the war may amount to about 20 million pounds annually. With production at this rate, imports, if any, will probably be very small and consist of special types.

POST-WAR LONG TERM

Consumption, Production, and Imports

In view of the uncertainties regarding the outcome of the research for improving hemp processing, referred to above, it is difficult to estimate future consumption. Should present experiments be successful, consumption might greatly increase over the 1939 level (chiefly at the expense of flax). Most of this increase would probably be supplied by domestic production. To take account of this possibility, relatively wide ranges are used in the following estimates for domestic production and consumption.

The effect on consumption of a 50-percent change in the duties (through the effect on hemp prices) would probably be more than offset by compensating effects of similar duty changes on hemp manufactures. A 50-percent reduction in the duties (including those on hemp manufactures) would probably result in larger imports of hemp manufactures and smaller consumption of fiber. Similar, but opposite shifts, would result from a 50-percent increase in duties.

Per capita income at 1939 level.

Consumption might be 2.5-6.0 million pounds, and domestic production 1-3 million pounds, depending in part on the rates of duty on hemp and hemp manufactures.

Duties as in 1939.—Consumption might be between 3.2 and 5 million pounds, of which imports might supply about 2 million pounds, with a foreign value of \$280,000. Production for the domestic market might be 1.2-3.0 million pounds, valued at \$170,000-\$420,000.

Duties reduced by 50 percent.—Consumption might be 2.5-3.5 million pounds; imports might be 1.5 million pounds, with a foreign value of \$210,000. Production for the domestic market would then be 1-2 million pounds, valued at \$140,000-\$280,000.

Duties increased by 50 percent.—Consumption might be 4–6 million pounds, of which imports might supply 2½ million pounds, with a foreign value of \$350,000. Production for the domestic market would be 1.5–3.5 million pounds, valued at \$210,000–\$490,000.

Per capita income 75 percent higher than in 1939.

Consumption of soft-fiber products may be expected to be somewhat larger, perhaps 25 percent larger than if income were unchanged. Consumption of hemp in uses such as shoe thread and twines would probably increase moderately, and some expansion in marine products to supply increased naval and maritime needs might reasonably be expected. The price of hemp would probably increase 10–15 percent in line with an increase in the general price level.

Duties as in 1939.—Consumption would probably be 4–6 million pounds, of which imports might supply 2½ million pounds, with a foreign value of \$400,000. Production for the domestic market would then be 1.5–3.5 million pounds, with a value of \$240,000–\$560,000.

Duties reduced by 50 percent.—Consumption might be within the range of 3–4½ million pounds. Imports might supply 1.8 million pounds, with a foreign value of about \$290,000. Production for the domestic market would be 1.2–2.7 million pounds, valued at \$190,000–\$430,000.

Duties increased by 50 percent.—Consumption might total 5–7½ million pounds, of which imports might supply 3 million pounds, with a foreign value of about \$480,000. Production for the domestic market would then be 2–4½ million pounds, with a value of \$320,000–\$720,000.

Exports

United States exports of hemp fiber have been nil or negligible and are likely to be negligible after the war.

Employment

Employment in the production of hemp fiber after the war might range from 150 to 300 persons, depending upon the level of national income and upon the rates of duty on finished products of hemp and flax.

CRIN VEGETAL

Tariff paragraph: 1001.

Commodity: Crin vegetal.

Rate of duty: 1¢ per pound (\$22.40 per ton). *Equivalent ad valorem (1939):* 90%

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (long tons).....	5, 109
Value (\$1,000).....	126
Unit value (per long ton).....	\$24. 75

¹ Foreign value.

Crin vegetal, a vegetable hair-like fiber, is obtained from the leaves of a hardy dwarf fan palm which grows wild in Morocco, Algeria, and Tunisia. It is not produced in the United States. It is used as a

filling material, mainly for low-priced upholstered furniture, and to a lesser extent in cheap mattresses. The most nearly similar filling materials, such as Spanish moss and flax upholstery tow, are not closely competitive with crin vegetal. The selling price of Spanish moss is normally about double and that of flax upholstery tow about half the price of the crin vegetal imported from North Africa.

POST-WAR SHORT TERM

Presumably, large quantities of upholstered furniture will be produced in the immediate post-war years because of purchases postponed during the war, and because of the number of new houses to be constructed and furnished. It appears likely that imports of crin vegetal during this period may be considerably higher, perhaps as much as 200 percent higher, than the 1939 level.

POST-WAR LONG TERM

Because of the small proportion which filling material bears to the total cost of upholstered furniture, and because of the difference in physical properties and price between crin vegetal and other filling materials, an increase or decrease of one-half cent per pound in the duty on this material, although the rate is high, probably would have only a moderate effect on imports of crin vegetal. A swing in foreign value in the period 1930-39, comparable to a 50 percent change in duty, did not seem to have had much influence upon the volume of imports. Such a change in duty would still leave the price to the United States consumer materially different from the prices of the most nearly competitive commodities.

Per capita income at 1939 level.

Under these conditions, the quantity of imports (equivalent to consumption) might be only moderately greater than in 1939, or about 5.5 thousand tons.

The foreign import value of \$24.75 per ton in 1939 was low; the range in the preceding 5 years had been from about \$31 to \$40. Assuming an average unit value of \$35 per ton, the total foreign value of imports would be about \$190,000 a year, an average about 50 percent greater than in 1939.

Per capita income 75 percent higher than in 1939.

Total production of furniture might increase considerably; at the same time there might be an increase (though probably not to the same degree) in production of the cheaper types of furniture in which crin vegetal was used. The demand for crin vegetal would be stimulated further by the tendency to replace upholstery more frequently. Under these circumstances, annual imports of crin vegetal might be about 8,000 tons, or 60 percent greater than in 1939. Again assuming an average foreign unit value of \$35 per ton, the total foreign value of imports would be in the neighborhood of \$280,000, or about twice as great as in 1939.

FLAX YARNS, ETC.¹

Tarif paragraph	Commodity	Rate of duty	Equivalent ad valorem (1938)
1004-----	Yarns, threads, twines, and cords of flax, hemp, and ramie:		} 27%.
	Single yarns of flax, not finer than 60 lea.....	25% ad val.....	
	Single yarns of flax, finer than 60 lea.....	15% ad val.....	
	Single yarns of hemp or ramie, not finer than 60 lea.....	35% ad val.....	
	Single yarns of hemp or ramie, finer than 60 lea.....	25% ad val.....	
	Threads, twines, and cords, composed of two or more yarns of flax twisted to- gether.....	30% ad val.....	
	Thread, twines, and cords, composed of two or more yarns of hemp or ramie twisted together.....	40% ad val.....	

GENERAL

Data on United States production, imports and consumption for 1939 are given below:

Items	Production ¹	Imports	Apparent consump- tion	Ratio of imports to consump- tion
Quantity (1,000 pounds).....	5,800	2,137	2,987	Percent 25
Value (\$1,000).....	\$ 5,800	\$ 1,322		
Unit value (per pound).....	\$1.00	\$0.42		
Persons employed (number).....	500			

¹ Exports not separately recorded; probably insignificant.

² Estimated.

³ Foreign value.

Flax yarns are used in the United States mostly in making linen thread, toweling, webbing, and fire hose. Hemp yarns (in smaller quantities) are used in twine, cords, and small rope. Threads, twines, and cords of flax and hemp serve chiefly as sewing or shoe thread, broom-, Jacquard-, sail-, and harness-twine, fish nets, fish lines, and small lines. Imports of flax and hemp yarns originate principally in the United Kingdom, Belgium, and Italy. Yarns of ramie can be employed in many of the same uses as yarns of flax or hemp, but ramie imports from China have been negligible. United States production of these yarns and related products has the same uses as the imported yarns and is in direct competition with them; practically no yarn, however, is made for sale.

Most of domestic and imported yarns are in the utility rather than the luxury class. During the war, yarns, threads, and twines of flax and hemp have been restricted to war-connected uses; cotton has been substituted in several products, particularly in the manufacture of

¹ In this discussion the term "flax yarns, etc." is used in lieu of the full description "Yarns, threads, twines, and cords of flax, hemp, and ramie, or mixtures of them."

shoe thread and of webbings for military purposes. Even under peacetime conditions, cotton shares the market with flax and hemp in a number of cases. With higher income (in the long term), however, consumption of linen products would probably gain at the expense of cotton, particularly where price has been the principal factor.

POST-WAR SHORT TERM

Immediately after the war, a considerable backlog of yarn requirements will have to be supplied for civilian needs. Although cotton has been substituted during the war in several products in which flax and hemp are ordinarily employed, it appears probable that the latter will readily regain their markets. Imports of flax and hemp yarns, and so on might be in the neighborhood of 5 million pounds and domestic production might be about 9 million pounds.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Per capita consumption of flax, hemp, and ramie yarns, threads, twines, and cords would probably be at the approximate level of 1939; allowing for increased population, total consumption might be about 10 million pounds.

Duty as in 1939.—The proportion of consumption supplied by production and imports might be about the same as in 1939. Domestic production might be about 6.5 million pounds, valued (at 1939 unit values) at 6.5 million dollars; imports might be about 3.5 million pounds, with a total foreign value (at 1939 unit values) of 1.5 million dollars.

Duty reduced by 50 percent.—Consumption probably would be supplied largely by imports, which might amount to about 8 million pounds, with a foreign value of about 3.4 million dollars. Domestic production might be 2 million pounds, valued at 2 million dollars.

Duty increased by 50 percent.—Domestic production, which would probably supply consumption to a large extent, might amount to about 8 million pounds, valued at 8 million dollars and imports to only about 2 million pounds, with a total foreign value of \$840,000.

Per capita income 75 percent higher than in 1939.

Consumption of linen products would be likely to gain at the expense of cotton, when incomes are higher. Consumption of flax, hemp, and ramie yarns, threads, twines, and cords might reflect this movement and might be in the neighborhood of 12 million pounds, or 20 percent higher than with no change in income. Average unit values would probably increase with the rise in the general price level and might be about \$1.15 for domestic production and 50 cents for imports (foreign value).

Duty as in 1939.—Domestic production might supply about 8 million pounds, at a total value of 9.2 million dollars, and imports might be about 4 million pounds, valued at 2 million dollars (foreign value).

Duty reduced by 50 percent.—Imports might supply 9 million pounds, with a total foreign value of about 4.5 million dollars, and production 3 million pounds, valued at 3.5 million dollars.

Duty increased by 50 percent.—Imports might be only 3 million pounds, with a total foreign value of about 1.5 million dollars. Production, supplying consumption to a large extent, might be about 9 million pounds, valued at 10.4 million dollars.

Employment

In the post-war period, employment in the domestic production of yarns, etc., of flax, hemp, and ramie (assuming the same ratio of employment to output as in 1939) might range from 200 to 800 persons, depending on the assumption as to national income and rates of duties.

HARD-FIBER ROPE

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939) (average)
1005 (a) (1)	Cordage wholly or in chief value of manila (abroad) or other hard fiber:		
	Manila (except from the Philippines):		
	$\frac{3}{8}$ " or over	2¢ per lb.	} 25%.
	Under $\frac{3}{8}$ "	2¢ per lb. + 15% ad val.	
	Sisal:		
	$\frac{3}{8}$ " or over	1¢ per lb.	} 25%.
	Under $\frac{3}{8}$ "	1¢ per lb. + 7½% ad val.	
	Other:		
	$\frac{3}{8}$ " or over	2¢ per lb.	} 25%.
	Under $\frac{3}{8}$ "	2¢ per lb. + 15% ad val.	
	Manila from the Philippines.	Free. (See note.)	4%.
	Average, all imports.		4%.

NOTE.—The Tariff Act of 1930 imposed the rate of 2 cents per pound on all hard-fiber cordage three-quarters of an inch or over in diameter and 2 cents per pound plus 15 percent ad valorem on cordage less than three-quarters of an inch in diameter. The rates were reduced 50 percent on sisal cordage pursuant to the agreement with the Netherlands, effective February 1, 1932, and on other cordage (except manila) pursuant to the agreement with Mexico, effective January 20, 1932. Imports from the Philippines (manila rope) are duty-free but subject to quota.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds)	192.1	2.3	69.8	2.9	62.7	Percent
Value (million dollars)	12.2	.4	12.8	7.8		
Unit value (cents per lb.)	14.1	14.7	14.1	27		
Persons employed (number)	2,000					
	2,000					

* Does not include production of rope by United States Navy for its own use, and by penal institutions.
 † Foreign value.

In 1939 approximately 85 percent of the United States imports of hard-fiber rope of all kinds originated in the Philippine Islands. Imports from the Philippines were virtually all of manila rope. They were admitted free of duty but were limited by an absolute quota to 6 million pounds in each 12 months' period (from May 1 to April 30).

This quota was 1 million pounds less than the average annual imports from the Philippine Islands during the depression years from 1930 to 1934, inclusive. Limitation of the imports by quota became effective May 1, 1935, and, under existing law, is to terminate July 4, 1946, when shipments from the Philippine Islands will become subject to the payment of full import duties upon entry into the United States, unless some new arrangement is introduced in the meantime. Until supplies of manila were cut off by the war, imports of sisal and henequen rope were very small. It is estimated that 95 percent of the imports and 80 percent of the United States production and exports of hard-fiber rope in 1939 were of manila fiber. The bulk of the remainder consisted of sisal rope.

Production of hard-fiber rope in the United States is entirely from imported fiber. Manila fiber has been obtained almost exclusively from the Philippine Islands and sisal fiber from the Netherlands Indies, British East Africa, and Haiti. Since 1942, when the United States was cut off from its sources of supply for manila fiber, substitute materials, chiefly sisal, have been used in the manufacture of rope.

Under the Tariff Act of 1922, imports from the Philippine Islands (admitted duty-free and without restriction as to quantity) averaged 5.7 million pounds per year; and, following an increase in the rates of duty on imports from other countries under the Tariff Act of 1930, imports from the Philippines increased (to an average of 7.6 million pounds in the 3 years 1932-34) and those from other countries declined. This rapid increase in imports from the Philippines led to the establishment of the quota, in 1935, as previously mentioned.

During the war, the consumption of hard-fiber rope in the United States has increased greatly. In 1943 the requirements of the Army, Navy, and Maritime Commission alone were 200 million pounds, or twice as great as the total supply in 1939, and the minimum requirements for civilian use accounted for an additional 40 million pounds. Although imports of henequen rope from Mexico and Cuba have been a factor, the increased requirements have been met to an overwhelming extent by the domestic industry, through extending the hours of plant operation and through applying to the manufacture of rope equipment which formerly had been used in making hard-fiber wrapping twine. A much larger percentage of production than before the war has been of sisal rope.

Practically all the manila rope produced since 1941 and most of the sisal have been required for war uses. A substantial part of the industrial and civilian requirements has been supplied by rope made in the United States of other fibers such as cotton and jute, and by henequen rope imported from Mexico and Cuba.

POST-WAR SHORT TERM

When manila fiber is again available in sufficient quantity, United States consumption of manila rope will almost certainly be much larger than in 1939. This prediction is based on the probability of a larger United States Navy and Merchant Marine than before the war and also on the fact that after the war rope in use outside the maritime field will consist largely of the less-preferred cotton, jute, sisal, and henequen rope, which generally will be replaced by manila rope at the first opportunity. Total consumption of all hard-fiber rope (including that of manila) may be as much as 225 million pounds

a year. How much will be imported as rope will depend on the condition of the Philippine rope mills at that time, on the limitation (if any) on the imports of Philippine rope, and on the availability of supplies in the United Kingdom, the principal European source.

POST-WAR LONG TERM

Consumption, Production, and Imports

The following estimates are based on the assumption that imports from the Philippine Islands will be unrestricted as to quantity but will be subject to the payment of full duties after July 4, 1946. It is possible, however, that some new arrangements may be made by which United States imports of Philippine rope will be accorded some kind of preferential treatment for some time beyond July 4, 1946. In that event, it is also possible that the maximum quantity of such preferential imports would be limited by a quota arrangement along the lines of the one which became effective May 1, 1935. There are, of course, various intermediate possibilities between entire freedom of trade and the application of the full duties.

It should be noted that any modification of the 1939 tariff and quota status of the Philippines, even though falling short of application of the full tariff rate to cordage, would affect imports from the Philippines and other countries as well.

Per capita income at 1939 level.

It is believed that at the same per capita income there would be no increase of per capita consumption over 1939 except in marine cordage. This use accounted for about 46 million pounds of manila rope in 1929, but the quantity in later years was smaller, and in 1939 it probably was not more than 30 million pounds, or about 30 percent of the total supply. Because of the anticipated increase in the merchant and naval shipping of the United States, the use of marine cordage after the war is expected to be greater than in 1939, and it may amount to 70 million pounds a year. If this expansion in marine cordage occurs, the total consumption of hard-fiber cordage may be 140 million pounds a year,¹ or about 40 percent greater than in 1939. Of this amount, the share furnished by production in the United States might range all the way from 90 to 98 percent, or 125 to 137 million pounds, depending on the volume of imports as affected by the rate of duty.

Duty as in 1939.—Because of increase in United States consumption, imports from sources other than the Philippine Islands might be about 50 percent greater than in 1939, and total 2 million pounds, with a foreign value of \$175,000 a year. The amount of imports from the Philippine Islands is problematical, since these imports may no longer be limited by quota, as in 1939, but may be subject to the full duty. This duty, on the basis of imports from the Philippine Islands in 1939, would be equivalent to 29 percent ad valorem, or 2½ cents a pound. The average foreign value of imports from the Philippine Islands since 1931 has ranged from 8½ to 11½ cents a pound, but of this amount a substantial part has represented the cost of the fiber, and the portion remaining to cover cost of manufacture generally has been only 4 to 6 cents a pound. This margin is hardly large enough to enable Philippine manufacturers to absorb a duty of 2½ cents a pound and to

¹ No account is taken of the amount of marine cordage the United States Navy will probably continue to produce for its own requirements.

continue sales in the United States on the same terms as before. The price of their product sold in this country presumably would increase, and the volume of imports would be reduced. Imports from the Philippine Islands might be 15 percent less than the quota permitted during recent years, and only about one-half as great as in 1934, the last full year in which the imports were unrestricted. On this basis they would amount to about 5 million pounds, with a foreign value of \$400,000 a year. Total imports from all sources would then be about 5 percent of consumption in the United States and would total about 7 million pounds, with a foreign value of \$575,000 a year.

On these assumptions as to consumption and imports, domestic production would be about 133 million pounds with a value, at perhaps 15 cents per pound, of about 20 million dollars.

Duty reduced by 50 percent.—Imports other than from the Philippines would still be subject to a duty as least one-third greater than under the Tariff Act of 1922. They might be 40 or 50 percent less than in 1929, which was the last full year under that act, and amount to about 5 million pounds ($2\frac{1}{2}$ times the figure estimated on the basis of the duty as in 1939), with a foreign value of \$450,000. On manila rope manufactured in the Philippines for supply to this market, the return to manufacturers possibly would not be far from the average during the 10 years ending in 1939, the effect of the lowering of the duty being approximately offset by the upward trend of prices of hard-fiber rope in the United States resulting from increased consumption. Imports from the Philippines might be close to the maximum during this period, and might approximate 10 million pounds, with a foreign value of almost \$850,000 a year. Total imports then would be about 10 percent of consumption in the United States and would amount to about 15 million pounds, with a foreign value of \$1,300,000 a year. In that case, domestic production would be about 125 million pounds, which, at a price slightly lower than with no change in duty, would be valued at about 18 million dollars.

Duty increased by 50 percent.—Imports probably would be very small. Those from the Philippine Islands might be 2 million pounds, with a foreign value of \$150,000 a year, and imports from other sources 1 million pounds, with a foreign value of \$80,000. Total imports would then represent about 2 percent of consumption in the United States and would amount to about 3 million pounds, with a foreign value of \$230,000 a year. Domestic production would then be about 137 million pounds, with a value of perhaps 21 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of hard-fiber rope might be about 15 percent greater than if per capita income had remained the same, and might amount to about 160 million pounds a year. Production in the United States would probably account for about the same proportion of the total, under different assumptions as to the duty, as with the lower income level. Prices might be about 15 percent higher than at the lower income level.

Duty as in 1939.—Imports from the Philippine Islands might be in the neighborhood of 6 million pounds, with a foreign value of \$600,000 a year, and imports from other countries about 2 million pounds, with a foreign value of \$250,000. Total imports would then represent about 5 percent of consumption in the United States and would be about 8 million pounds, with a foreign value of \$850,000 a year.

Domestic production would be about 152 million pounds, with a value around 17 cents per pound, or a total of about 26 million dollars.

Duty reduced by 50 percent.—Imports from the Philippine Islands might be 12 million pounds, with a foreign value of \$1,250,000 a year, and imports from other sources 6 million pounds with a foreign value of \$700,000 a year. Total imports then would be about 10 percent of consumption and would be around 18 million pounds, with a foreign value of nearly 2 million dollars a year. Domestic production might be about 142 million pounds, which, at perhaps 16½ cents per pound, would be valued at about 23 million dollars.

Duty increased by 50 percent.—Imports might amount to about 3.5 million pounds, with a foreign value of \$330,000 a year, of which perhaps two-thirds would be received from the Philippines. Domestic production would then be perhaps 157 million pounds, which, at, say, 17½ cents per pound, would be valued at about 27 million dollars.

Exports

Exports have been small in comparison with production, but have been about one-fourth as large as imports. They will probably not be greatly affected by such changes as may occur after the war in per capita income or in foreign trade policies here and abroad. Exclusion of imported rope from the domestic market would probably tend to reduce exports also.

Employment

Employment in the long-term post-war period might range anywhere from 2,500 to 4,000 persons, depending on the assumptions made above with respect to national income and level of duties. If the duty were reduced 50 percent, employment, because of larger imports, might be reduced by 5 or 6 percent below the level which would otherwise prevail. If the duty were increased 50 percent, the resulting replacement of imported rope by domestic might cause employment in the domestic industry to rise by 3 or 4 percent.

CORDS AND TWINES, OF HARD FIBER

(NOT INCLUDING BINDER TWINE)

Tariff paragraph: 1005 (b).

Commodity: Cords and twines, of hard fiber.

Rate of duty: 20 percent.

NOTE.—Rate reduced from 40 percent to 20 percent in the trade agreement with the Netherlands, effective February 1, 1933.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds).....	84, 118	7, 632	91, 750	Percent 12.4
Value (\$1,000).....	5, 393	7, 439		
Unit value (per pound).....	\$2, 690	\$2, 690		
Persons employed (number).....	2, 700			

¹ Exports are not separately reported but are probably negligible.

² Foreign value.

³ Estimated.

Hard-fiber twines (other than binder twine) were manufactured in the United States in 1939 principally from sisal. Production was almost entirely in mills which also produced hard-fiber rope. Some of the mills making wrapping twine and rope also produced binder twine.

Imports of hard-fiber cords and twines have been increasing in recent years. In 1939 they consisted almost entirely of henequen twine from Mexico and sisal twine from the Netherlands and Belgium. A large part of the imports was formerly obtained from the Netherlands, but imports from Mexico increased rapidly after 1937. In 1940 and 1941, almost all of the imports were from Mexico.

Because of the acute shortage of hard fibers during the war, the use of manila (abacá), sisal, and henequen fibers in the manufacture of wrapping twine was prohibited in October 1942. Furthermore, the complete dependence of the United States on foreign sources for supplies of these fibers led to the establishment of rigid import controls to assure that the fibers would be employed only for the most critical uses. Imports of wrapping twines made of the fibers mentioned were virtually prohibited.

POST-WAR SHORT TERM

Because of the expected increase in business activity and the lack of reserve stocks, consumption of hard-fiber wrapping twines in the first few years after the war may be very considerably greater than in 1939. In view of the fact that the productive capacity of the cordage industry in Mexico has been greatly expanded during the war, and the further fact that the principal source of the rapidly increasing imports of hard-fiber wrapping twine before the war was Mexico, it is likely that total imports (probably principally from Mexico) will be much larger than heretofore.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

It is unlikely that consumption of hard-fiber wrapping twine would increase over that in 1939 by more than the 10 percent which would be expected because of population growth. Consumption, with the duty as in 1939, would probably be at a rate of about 68 million pounds per year, and would be somewhat higher or lower if the duty were reduced or increased by 50 percent. Unit values of imports and production would probably be the same as in 1939.

Duty as in 1939.—Imports were increasing from 1936 to 1939 and under similar duty conditions in the post-war period would likely supply a larger percentage of consumption than in 1939—perhaps as much as 20 percent. They might, therefore, amount to about 14 million pounds per year; at a unit value of 6 cents per pound, as in 1939, this would give a foreign value of about \$850,000. Production might amount to about 54 million pounds, and, based on a value of 10 cents per pound, as in 1939, would be valued at about 5.4 million dollars.

Duty reduced by 50 percent.—Consumption might increase to 70 million pounds. Imports might supply about 60 percent of consumption, or 42 million pounds, with a foreign value (at 6 cents per pound) of about 2.5 million dollars. Production might be 28 million pounds, valued at 2.8 million dollars.

Duty increased by 50 percent.—Consumption might be 66 million pounds. This change in duty would establish the rate at 30 percent, compared with one of 40 percent when imports averaged 300,000 pounds per year (in 1931–35). The rate of 30 percent would reduce imports, but they still might supply about 15 percent of consumption, or about 10 million pounds, with a foreign value of about \$600,000. Production then would total about 56 million pounds, valued at about 5.6 million dollars.

Per capita income 75 percent higher than in 1939.

With a higher level of industrial activity at the increased income level, consumption of hard-fiber wrapping twine would probably be about 50 percent larger than at the lower income level.

Duty as in 1939.—Consumption would probably be at the rate of about 100 million pounds a year. Imports would perhaps supply the same proportion of consumption as with income as in 1939 and would be 20 million pounds with a foreign value (10–15 percent higher than in 1939) of 1.4 million dollars. The remaining 80 million pounds would be supplied by production, and, at the higher price level, would be valued at about 9 million dollars.

Duty reduced by 50 percent.—Consumption might increase to 105 million pounds. Imports might supply about 60 percent of consumption, and therefore be about 63 million pounds. At the higher price level they would therefore have a foreign value of about 4.3 million dollars. This would leave 42 million pounds to be supplied by production, which, at the higher price level, would be valued at about 4.7 million dollars.

Duty increased by 50 percent.—Consumption might decline to 95 million pounds. Imports might be about 14 million pounds, with a foreign value of about \$950,000. This would leave 81 million pounds, valued at almost 9.2 million dollars, to be supplied by production.

Employment

An estimated 1,750 persons were employed in this industry in 1939. In the post-war period employment might range between 900 and 2,800 persons, depending upon the national income and the duty level.

BURLAP

Tariff paragraph: 1008.

Commodity: Burlaps, and other woven fabrics of jute, n. s. p. f. (nonprocessed).

Rate of duty: 1¢ per lb.

Equivalent ad valorem (1939): 16%.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	441, 383
Value (\$1,000).....	127, 956
Unit value (per pound).....	\$0. 063

¹ Foreign value.

Burlap (ordinary jute cloth, plain woven of single yarns),¹ the textile manufacture imported in the greatest volume, is obtained entirely from abroad, 90 percent of it from India. About three-fourths is used in making bags for agricultural purposes, and one-fourth for industrial purposes, chiefly as a wrapping material. For bags, burlap competes with cotton fabrics; for wrapping, with paper. During the war, burlap has been replaced to a large extent by these competing materials.

The present duty on burlap is not of great importance among the factors affecting the price of burlap. A 50-percent increase or decrease in duty would probably have little effect on the trade.

POST-WAR SHORT TERM

During the first few years after the war, the imports of burlap will possibly be as much as 60-80 percent higher than in 1939, or 700-800 million pounds annually. This estimate is based in part on the probability that cotton bags during this period will be restricted in supply and high in price.

The future price of burlap is a matter of conjecture. Presumably it will be affected by the price of cotton fabric, which, if the cotton-loan program is continued, will probably be high. As a basis for this discussion, a foreign unit value of burlap imports 50 percent over 1939, that is, about 9 cents per pound, is taken as a minimum, and the foreign unit value of imports in 1942, about 12 cents per pound, is taken as a maximum. Applying these values to the estimated quantities that may be imported, the foreign value of imports in the short term might be within the range of 65-95 million dollars.

POST-WAR LONG TERM

Per capita income at 1939 level.

Over the long term, if the national income returns to the level of 1939, imports of burlap will probably be about the same in quantity and value as in that year, or about 440 million pounds, valued at 28 million dollars. Any increase that might have resulted from population growth would probably be offset by the greater use of bulk shipments and the substitution of paper in wrapping.

Per capita income 75 percent higher than in 1939.

In the long term, there may be a 15-30 percent increase above 1939 in the use of burlap for bags, and (despite losses to paper) an 80-100 percent increase in its use for industrial purposes. Imports may therefore increase by 35-50 percent over those in 1939, or to about 600-660 million pounds. Again applying the assumed range in unit values (9-12 cents) to the estimated amounts, the foreign value of imports might be as much as 55-80 million dollars.

¹ Jute bagging for covering cotton bales not included.

COARSE LINENS AND LINEN TOWELS

Tariff paragraph	Commodity	Rate of duty
1009(a)	Woven fabrics of flax (except padding and interlinings) over 30, not over 100 threads to the square inch, weighing 4 to 12 ounces per square yard, over 12 and not over 36 inches wide	50% ad val.
1014	Towels of flax:	
	Not over 120 threads to the square inch	50% ad val.
	Over 120 threads to the square inch	20% ad val.

Note.—The duties of the Tariff Act of 1930 in paragraph 1009(a) on flax fabrics and in paragraph 1014 on flax towels not over 120 threads to the square inch were reduced from 55 to 50 percent, and the duty on towels over 120 threads to the square inch was reduced from 40 to 20 percent, in the trade agreement with the United Kingdom, effective January 1, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production	Imports	Apparent consumption	Ratio of imports to consumption
Coarse linens (including towels not over 120 threads per square inch):				Percent
Quantity (1,000 pounds).....	1 3,794	1 1,631	5,425	29
Value (\$1,000).....	2,585	1,094		
Unit value (per pound).....	\$3.65	\$3.43		
Persons employed (number).....	1 500			
Towels over 120 threads per square inch:				Percent
Quantity (1,000 pounds).....	(?)	1 500	500	100
Value (\$1,000).....	(?)	1 500		
Unit value (per pound).....		\$1.01		

¹ Projected from square yards reported in 1937, and converted to pounds on the basis of 8 ounces per square yard. No exports reported.

² Includes towels for which the weight is estimated from the number, on the basis of 4 ounces per towel.

³ Foreign value.

⁴ Estimated.

⁵ Negligible.

⁶ Weight estimated from the number on basis of 3 ounces per towel.

Towels not over 120 threads to the square inch, consisting of crash (kitchen) towels, represented 60 percent of the quantity and 65 percent of the value of imports of coarse linens in 1939.¹ The remainder consisted principally of crash toweling to be cut and hemmed into kitchen towels in the United States, but included limited quantities of other fabrics, such as huck toweling for making face towels, pillow linen, and linen decorative fabrics. Practically all coarse linens produced in the United States consist of crash toweling and towels for kitchen use.

Besides the imports of towels and toweling of coarse linens referred to above, there are considerable imports of towels with over 120 threads to the square inch, consisting principally of huck (face) towels for bathroom use. The very large domestic production of bathroom towels of huck type consists mostly of towels in chief value of cotton, to which the imports of linen face towels, being much higher priced, afford negligible competition; domestic production of linen face towels is very insignificant.

During 1933-37, when economic activity in general was increasing, consumption of coarse linens declined, apparently as the result of a

¹ As used here and elsewhere in this report the term coarse linens refers both to the linen fabrics dutiable under paragraph 1009(a) and linen towels not over 120 threads to the square inch.

trend toward the use of cotton. Estimated consumption was 6.4 million pounds in 1937, and about 5.4 million in 1939, compared with 8.4 million pounds in the census years 1931-33. A downward trend was apparent both in production and imports, the latter having continued to decline in 1939, even after reduction of the duty in the trade agreement with the United Kingdom on January 1 of that year.

Estimated imports (apparent consumption) of linen face towels (over 120 threads to the square inch) were 679,000 pounds in 1931 and remained between 500,000 and 600,000 pounds until 1938, when they declined to 393,000. They rose to 586,000 pounds in 1939, after reduction of the duty, effective January 1 of that year.

In 1939 and the years immediately preceding, imports of both coarse linens and linen face towels came principally from the United Kingdom, although large quantities (particularly of coarse linens) were also received from the Soviet Union, Czechoslovakia, and Belgium.

United States exports of coarse linens and linen towels are not recorded separately but are known to be negligible.

POST-WAR SHORT TERM

Consumption will probably be considerably greater than in 1939, because of the relatively favorable per capita income that is assumed, and because of the unusually large number of persons who will be setting up housekeeping after the war. Both production and imports will probably be large. The imports will depend somewhat on the relation of the available supplies abroad to the demand there. However, this relation probably will not be so restrictive a factor for these fabrics as for other fabrics, since the local needs in foreign countries may be supplied by less expensive materials than linen.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—Because of the declining trend which prevailed for some years before the war, production and imports of coarse linens probably would be barely as great as in 1939, in spite of increase in population. Consumption might be about 5.4 million pounds, of which possibly 3.8 million would be supplied by production in the United States, and 1.6 million by imports. Average values might be about the same as in 1939, in which case the total value of production (at 68 cents per pound) would be 2.6 million dollars and that of imports (at 43 cents) 0.7 million dollars (foreign value).

Imports (apparent consumption) of linen face towels (over 120 threads per square inch) might also be about the same as in 1939, or approximately 600,000 pounds, with a foreign value of \$600,000 a year.

Duty reduced by 50 percent.—The average price of coarse linen fabrics in the United States (production and duty-paid imports) would probably be lower by 6 cents a pound, or even more, than estimated above, on the basis of unchanged duties and as a result consumption would possibly rise to about 6 million pounds a year. Imports might be almost twice as great as with unchanged duties, and might total 3 million pounds with a foreign value (again at 43 cents per pound)

of 1.3 million dollars a year. Production in the United States possibly would be about 25 percent less in quantity and 30 percent less in value than with unchanged duties and would total 2.9 million pounds, valued at 1.8 million dollars a year (62 cents per pound).

Imports of linen face towels might be considerably greater than if the duty were unchanged. An increase of 16½ percent is assumed, in which case imports would be about 700,000 pounds with a foreign value of \$700,000 a year.

Duty increased by 50 percent.—The average value of coarse linen fabrics in the United States might be higher by 6 cents a pound, or more, than it would be under the 1939 level of tariffs, and as a result consumption might decline to about 5 million pounds a year. Imports might be only 35–40 percent as much as with no change in the duty, and might total about 600,000 pounds, with a foreign value of \$260,000 a year (43 cents per pound). Production, on the other hand, might be 15 percent greater in quantity and 25 percent greater in value than if the duty remained as in 1939. It would then be in the neighborhood of 4,400,000 pounds valued at \$3,260,000 a year (74 cents per pound).

Imports of linen face towels might be about 15 percent less in quantity and value than if the duty were unchanged, in which case imports would be about 500,000 pounds with a foreign value of \$500,000 a year.

Per capita income 75 percent higher than in 1939.

Although little relation has been apparent since 1931 between the consumption of coarse linen fabrics and per capita income, it seems reasonable to suppose that some increase in consumption would occur as the result both of greater demand for all textiles, and a possible tendency to use linen dish towels and other articles of coarse linen fabric in place of the less expensive articles of cotton. An offsetting factor, however, would be the likelihood that, for some articles, there would be a tendency to shift from coarse linens to fine. Consumption might be 10–15 percent greater, depending on the rate of duty, than on the basis of per capita income the same as in 1939. Presumably about the same rate of increase would apply to both production and imports.

The demand for linen face towels, which partake of a luxury character, might be 35–60 percent greater, depending on the rate of duty, than at the lower level of income.

As the result of a general advance in commodity prices, the average value of production and imports, under the three assumptions as to level of duty, might be 10–15 percent greater than with income the same as in 1939.

Upon the basis of the foregoing considerations, the following estimates have been derived in the same manner as those made under the assumption of a lower per capita income.

Duty as in 1939.—Consumption of coarse linens might be 6.1 million pounds a year, of which 1.8 million, with a foreign value of \$865,000 (48 cents per pound) would possibly be supplied by imports, and 4.3 million, with a value of \$3,300,000 (77 cents per pound), by domestic production. Imports (apparent consumption) of linen face towels might be 870,000 pounds with a foreign value of 1 million dollars a year (about \$1.15 per pound).

Duty reduced by 50 percent.—Consumption of coarse linens might be 6.5 million pounds a year, of which 3.4 million, with a foreign value of \$1,630,000, would possibly be supplied by imports, and 3.1 million, valued at \$2,170,000, by domestic production. Imports of linen face towels might be 950,000 pounds, with a foreign value of \$1,100,000 a year.

Duty increased by 50 percent.—Consumption of coarse linens might be 5.7 million pounds a year, of which 0.7 million, with a foreign value of \$336,000, would possibly be supplied by imports, and 5 million, valued at \$4,200,000, by domestic production. Imports of linen face towels might be 0.8 million pounds, with a foreign value of \$900,000 a year.

Exports

Under any of the conditions premised in this report, exports would probably remain negligible, as in the past.

Employment

Depending on the rates of duty, post-war employment might be 650 to 900 persons if per capita income is the same as in 1939, and 700 to 1,050 persons if per capita income is 75 percent greater than in 1939.

MISCELLANEOUS FLAX FABRICS AND MANUFACTURES

Tariff paragraph: 1009 (part), 1010, 1011 (part), 1013, and 1014 (part).

Commodity: Miscellaneous flax fabrics and manufactures.

Rate of duty: 20% to 30% ad valorem. *Average (1939):* 23%.

NOTE.—The rates of duty on these products were reduced under the agreements with Belgium (effective May 1, 1935) and the United Kingdom (effective January 1, 1939). On the basis of 1939 imports, the reductions amounted to about 45 percent on the average, compared with the average rate that would have prevailed had the rates in the Tariff Act of 1930 been in effect.

GENERAL

Imports in 1939 of these products, together with rates of duty, were as follows:

Tariff paragraph	Import classification	Rate of duty		Imports, 1939 1,000 dollars
		Tariff Act of 1930	Trade agreement ¹	
1009 (b)	Flax or hemp paddings or interlinings for clothing	55	20	900
1010	Woven fabrics, n. s. p. l., of vegetable fiber other than cotton and jute (mostly linens)	40	20	5,414
1011	Plain-woven light-weight fabrics of vegetable fiber except cotton and jute (mostly linen)	25	20	2,200
1013	Linen table damask and manufactures (except napkins):			
	Not exceeding 120 threads to the sq. in.	45	20	620
	Exceeding 120 threads to the sq. in.	45	25	1,000
1014	Linen napkins, finished or unfinished:			
	Not exceeding 120 threads to the sq. in.	55	20	140
	Exceeding 120, not exceeding 130 threads to the sq. in.	40	20	222
	Exceeding 130 threads to the sq. in.	40	25	321
	Flax, hemp, or ramie sheets and pillowcases (mostly flax)	40	25	154
	Total, or average	45	23	12,900

¹ Rates in effect January 1, 1939.

² Includes fabric imported for use in the manufacture of linen handkerchiefs with an estimated foreign value of approximately 2 million dollars.

Practically the entire United States consumption of these products has always been supplied by imports. These imports have originated principally in the United Kingdom, Czechoslovakia, and Belgium, and are normally much higher in price than similar products made of cotton. The ultimate consumer is usually influenced by the tradition of superior quality and the prestige attaching to imported linen goods sufficiently to offset price differences which would result from the assumed duty changes.

On the basis of quantity, domestic sales (that is, imports) of most of these articles have tended to decline during 1929-39, although unit values have tended to rise somewhat. This decrease in consumption has largely been the result of style factors.

POST-WAR SHORT TERM

United States imports of these products have been greatly curtailed during the war. Assuming that foreign sources of supply can be promptly restored to full production, they might expect to fill an immediate United States demand at least double that of 1939 in quantity. Foreign unit values would probably be considerably higher than in 1939, so that the prices consumers would be willing to pay might be appreciably more than the 1939 prices, causing the total foreign value of imports to be more than double the 1939 level, or perhaps well in excess of 20 million dollars per year.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

In view of the pre-war downward trend in the consumption of the articles covered by this statement, imports (that is, consumption) in terms of quantity would probably be the same as in 1939, notwithstanding increased population. However, prices might be 10 percent higher than in 1939, so that the foreign value of imports might be about 14 million dollars. A 50-percent increase or decrease in the duties applicable to these products would affect the total value of imports to some extent, possibly by one-fourth to one-half million dollars in either direction.

Per capita income 75 percent higher than in 1939.

Although consumption of these fabrics and manufactures has shown little apparent relation to per capita income during the 1930's, it is probable that some increase in consumption would occur as a result of a generally greater demand for all textiles. Consumption would probably increase in quantity by 15 percent, but unit prices might increase by as much as 20 percent. The foreign value of imports might then be about 19 million dollars, with no change in duties, and from \$450,000 to \$750,000, more or less, in either direction, with changes of 50 percent in duties.

JUTE INTERLINING

Tariff paragraph: 1009 (b).

Commodity: Paddings and interlinings of jute.

Rate of duty: 30% ad val.

NOTE.—The rate fixed in the Tariff Act of 1909 was 50 percent; it was reduced to 30 percent, effective January 1, 1939, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production and imports for 1939 are given below:

Item	Production	Imports
Quantity (1,000 pounds).....	(1)	3,014
Value (\$100).....	(2)	3,200
Value (per pound).....		\$1.06
Persons employed.....	(3)	

¹ Data not available but production believed to be small or negligible relative to imports.

² Data are not available.

³ Foreign value.

In 1939, imports of jute interlinings were about two-thirds greater than the average of the preceding 8 years (1.8 million pounds). The increase probably resulted in large measure from shipments which ordinarily would have been made during the previous year but which were delayed in anticipation of the reduction in duty, which was lowered from 50 to 30 percent ad valorem in the trade agreement with the United Kingdom, effective January 1, 1939.

Paddings or interlinings are used chiefly in men's coats and overcoats. They are cut to size and stitched between the outer fabric and the lining of the garment to hold it in shape. Jute interlining is generally woven with a cotton warp and jute filling, and is treated to resist the softening action of moisture in rainy weather and in the processes of cleaning and pressing. The average weight of interlining per coat is approximately 0.3 pound.

United States production of interlinings is negligible, compared with imports. Virtually all imports of jute interlinings come from the United Kingdom and Belgium. Jute interlining has shared the market with flax interlining (which has been imported principally from the same sources) in the ratio of about two to three. Flax interlining has been 50 to 80 percent higher in price. The rate of duty on both commodities is the same (30 percent ad valorem). The cost of interlinings is small in relation to the total cost of the garments in which they are used. Nevertheless, a marked change in the relation between the prices of flax and jute interlinings would cause a substitution of one for the other.

Consumption probably would not be affected materially by an increase or decrease of 50 percent in the duty on jute interlinings (assuming a parallel change in the duty on flax interlining), but would be directly affected by the consumption of woollens and worsteds. A 50-percent change in the duties on woollens and worsteds would affect consumption to some extent but not very greatly.

POST-WAR SHORT TERM

Requirements for jute interlinings immediately after the war will probably be high because of sharply reduced wartime imports, the depletion of existing stocks, and the unusual activity which may be expected in the men's and women's suit and overcoat industry. Imports of jute interlining in the short term may increase by 50 percent above the relatively high level of 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

As the result of population increase, the United States consumption of jute interlining, whether or not the duty is reduced or increased by 50 percent, might be about 10 percent greater than in the late thirties, or amounting to approximately 2 million pounds, all of practically all of which would be imported. The average unit foreign value might be about the same as in 1939, or 22 cents per pound, and the total foreign value of imports would thus be in the neighborhood of \$440,000.

Per capita income 75 percent higher than in 1939.

With the rise in clothing purchases owing to higher per capita income, consumption of jute interlining might total about 2.5 million pounds (one-fourth more than with no change in income), all or practically all of which would probably be supplied by imports. The unit foreign value of jute interlining might be about 10-15 percent greater than in 1939, or about 25 cents a pound, in which case the total foreign value of imports would be about \$625,000.

JUTE WEBBING

Tariff paragraph: 1015.

Commodity: Jute webbing, not over 12 inches in width.

Rate of duty: 35% ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (million pounds).....	3.5	3.9	7.4	Percent 58
Value (\$1,000).....	529	525		
Unit value (per pound).....	\$0.15	\$0.08		
Persons employed (number).....	200-300			

¹ Exports not separately reported, probably negligible.

² Estimated.

³ Foreign value.

Jute webbings are used principally as a support for springs or cushioning material in the seats and backs of upholstered furniture. Domestic production declined sharply, and steadily, from 6.1 million pounds in 1929 to 2.4 million pounds in 1934. It rose to about 3.5 million pounds in 1935 and ranged between 3 million and 3.5 million pounds a year in 1936-39. Imports, principally from British India and Belgium, rose steadily from 0.5 million in 1929 to 3.9 million in 1939.

About half the domestic production is woven in the mills in which the yarn is spun and the remainder is woven from purchased yarn, nearly all of which is spun in the United States.

Heavy jute burlap (imported) competes with jute webbing in upholstery uses. More recently a unit consisting of metal rods and springs has been developed and its use in place of jute webbing in the seats of

upholstered furniture was increasing rapidly before the war; it may prove a substantial factor in the long-term post-war period. If so, substitution will be chiefly at the expense of domestic production, most of which consists of the heavier qualities of jute webbing used in seats. The imported webbing is generally of the lighter weight and is used chiefly in the sides and backs of furniture.

POST-WAR SHORT TERM

Because of the backlog in the demand for furniture, the consumption of jute webbings is likely to be high. Taking the use of substitutes into account, it might be about 9-10 million pounds, of which imports might supply 5-6 million and domestic production the balance.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Per capita consumption might be about the same as in 1939, losses to competitive products being approximately offset by continued expansion of the market for upholstered furniture. Allowing for population increase, consumption of jute webbing might be 7-8 million pounds a year. The average unit value of production and imports possibly would be about the same as in 1939, or 15 cents per pound and 8 cents per pound, respectively.

Duty as in 1939.—Imports might supply about the same proportion as in 1939. Production then would be about 3.5 million pounds, valued at \$525,000, and imports about 4 million pounds, with a foreign value of \$320,000.

Duty reduced by 50 percent.—Imports might be about 40 percent higher than with the duty as in 1939, or 5.5 million pounds, with a total foreign value of \$440,000, and domestic production might be 2 million pounds, valued at \$300,000.

Duty increased by 50 percent.—Imports might be about 35 percent less than with the duty unchanged, or 1.5 million pounds, with a total foreign value of \$120,000. Production then would account for 75-80 percent of the total supply and would possibly total 6 million pounds, with a value of \$900,000.

Per capita income 75 percent higher than in 1939.

Because of increased demand for upholstered furniture, in which this material is used, consumption of jute webbing might be about 40 percent higher than with no increase in income, or about 10-11 million pounds a year. The unit values of production and imports might increase to about the same extent as the general price level or 10-15 percent. The average value of domestic production would then be about 17 cents per pound, and the average foreign value of imports be about 9 cents per pound.

Duty as in 1939.—Imports might supply the same proportion of consumption as in 1939. Production then would be about 5 million pounds, valued at \$850,000; and imports would be 5.5 million pounds, with a total foreign value of \$500,000.

Duty reduced by 50 percent.—Imports might be about 7.5 million pounds, with a total foreign value of \$675,000, and domestic production approximately 3 million pounds, valued at about \$500,000.

Duty increased by 50 percent.—Imports might be 2.5 million pounds, with a total foreign value of \$225,000; production might be considerably larger, possibly 8 million pounds, with a total value of about 1.4 million dollars.

Exports

United States exports of jute webbing are not separately recorded but are known to have been negligible.

Employment

On the basis of the above estimates, employment might range between 200 and 350 persons, depending on the assumed level of duties and national income.

PLAIN LINEN HANDKERCHIEFS

Tariff paragraph: 1016.

Commodity: Handkerchiefs of vegetable fiber other than cotton, not ornamented.

Rate of duty: Not hemmed, 20% ad val. Hemmed or hemstitched, or unfinished, if having drawn threads: Made with hand-rolled or hand-made hems, 50% ad val., plus 1¢ each; other, 35% ad val.

Equivalent ad valorem (1939): 27% (average); 57% (made with hand-rolled or hand-made hems).

NOTE.—Pursuant to the trade agreement with the United Kingdom, effective January 1, 1939, the rate on linen handkerchiefs, not hemmed, was reduced from 35 to 20 percent ad valorem; on linen handkerchiefs, hemmed or hemstitched, or unfinished, having drawn threads (except those made with hand-rolled or hand-made hems), was reduced from 50 to 35 percent ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Total production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Handkerchiefs of vegetable fiber other than cotton:				
Unfinished (not hemmed, etc.):				<i>Percent</i>
Quantity (1,000 dozen).....		1 876	834	100
Value (\$1,000).....		1 817		
Unit value (per dozen).....		\$0.98		
Finished:				
Quantity (1,000 dozen).....	6,909	1 182	6,902	2.3
Value (\$1,000).....	9,800	1 226		
Unit value (per dozen).....	\$1.44	\$1.30		
Persons employed (continental United States only).....	800-1,000			

¹ Includes shipments of plain linen handkerchiefs from Puerto Rico to the United States, estimated at 1 million dozen, valued at 14 million dollars. No reported exports.

² Consists of 734,000 dozen "Handkerchiefs, not hemmed," with a foreign value of \$717,000, and an estimated 100,000 dozen "Handkerchiefs, unfinished if having drawn threads," with a foreign value of \$109,000.

³ Consists of 50,000 dozen "Handkerchiefs, hemmed or hemstitched, made with hand-rolled or hand-made hems," with a foreign value of \$97,000, and an estimated 100,000 dozen "Handkerchiefs, hemmed or hemstitched" (other than those made with hand-rolled or hand-made hems), with a foreign value of \$120,000.

The manufacture of linen handkerchiefs in the United States is entirely from imported linen fabric. The woven fabric has been obtained principally from the United Kingdom and has entered the United States either in the form of unfinished handkerchiefs or as piece goods.¹

Of the 6.8 million dozen linen handkerchiefs produced in 1939 in the United States, including Puerto Rico, an estimated 88 percent, or about 6 million dozen, were made of fabric imported in the piece, and the remainder, or 836,000 dozen, were made from imported unfinished handkerchiefs. Imports of handkerchiefs with hand-rolled or hand-made hems (constituting about one-third of total imports of finished handkerchiefs) have come principally from France and China, whereas practically all of the other finished handkerchiefs have been imported from the United Kingdom, with small quantities from Syria. Domestic production of handkerchiefs with hand-rolled or hand-made hems was largely confined to Puerto Rico, whereas the production in continental United States was more or less comparable to imports of other finished handkerchiefs.

POST-WAR SHORT TERM

During the war the United States supply of linen handkerchiefs has been negligible because foreign production of the material used in their manufacture has been practically discontinued. The small quantities of handkerchiefs on the market have sold at prices often four or five times those which prevailed before the war. Prices will probably remain abnormally high for several months after the war; they may not recede to less than 50 to 100 percent above 1939 prices. Consumption will probably be at least double the 1939 level.

POST-WAR LONG TERM

Consumption, Production, and Imports

Since a part of the domestic production of finished handkerchiefs (in 1939 about 12 percent) will probably again be manufactured from imported unfinished handkerchiefs, the foreign value of imports might be \$800,000, on the basis of the estimates given below of production of finished handkerchiefs under the 1939 income level, and under the higher income it would probably reach 1 million dollars. A 50-percent change in the rates of duty would probably affect the imports of both unfinished and finished handkerchiefs appreciably. However, any change in the imports of unfinished handkerchiefs would be reflected in the production of finished handkerchiefs. The estimates given below are confined to consumption, production, and imports of finished handkerchiefs.

Changes in the rates of duty on unfinished and finished handkerchiefs would, under the assumptions of Senate Resolution 341, be accompanied by a corresponding change in the duty on the fabric. Since the cost of the fabric would be a sufficiently large item in the cost of the handkerchiefs to make the duty on the material a significant item in the total cost, it seems not unlikely that this reduction of the duties would increase consumption of linen handkerchiefs by

¹ For imports of the linen fabric (par. 1611) see the section in this series on miscellaneous flax fabrics and manufactures.

an amount in excess of the probable increase in imports of finished handkerchiefs. Hence, in the estimates made below, domestic production is somewhat higher when the duties are reduced than with duties unchanged, and is somewhat lower when the duties are increased than with duties unchanged.

Per capita income at 1939 level.

Duty as in 1939.—Consumption would probably be about the same as in 1939, or 7 million dozen, notwithstanding increased population. Substitution of cotton handkerchiefs and even, at times, of paper tissues would probably offset an increase in the use of linen handkerchiefs as might otherwise occur. Imports would probably supply about the same proportion of consumption as in 1939, and might amount to about 175,000 dozen, with a foreign value (at 1939 unit prices) of about \$245,000. Domestic production would then be about 6.8 million dozen, valued (at 1939 prices) at about 9.8 million dollars.

Duty reduced by 50 percent.—Consumption might rise to 7.3 million dozen. Imports might be 350,000 dozen, with a foreign value of around \$485,000; production would then be 7 million dozen, valued at about 10 million dollars.

Duty increased by 50 percent.—Consumption might decline to 6.8 million dozen. Imports might decline to 100,000 dozen, with a foreign value of about \$140,000, and production might be 6.7 million dozen, valued at about 9.6 million dollars.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—It seems reasonable to suppose that some increase in consumption would occur as a result of both greater demand for all textiles and a possible tendency to use linen handkerchiefs in place of the less expensive cotton ones. Consumption might be about 15 percent greater than with income as in 1939, and amount to about 8 million dozen. Both the domestic and foreign prices would probably increase with the general price level, i. e., by 10–15 percent. Imports might be about 200,000 dozen, with a foreign value of about \$300,000. Production would then be about 7.8 million dozen, valued at about 12.7 million dollars.

Duty reduced by 50 percent.—Consumption might rise to 8.4 million dozen. Imports might increase to 400,000 dozen, with a foreign value of about \$625,000. Production would then be 8.0 million dozen, valued at about 13 million dollars.

Duty increased by 50 percent.—Consumption might decline to 7.7 million dozen. Imports might decline to 125,000 dozen, with a foreign value of about \$200,000. Production would then be 7.6 million dozen, valued at about 12.3 million dollars.

Employment

Employment in the long-term period would, with per capita income the same as in 1939, remain about the same as in that year, i. e., 800–1,000 persons. Under a per capita income 75 percent higher than in 1939, employment might increase to 1,000–1,200 workers.

JUTE BAGS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1018	Jute bags:		
	Processed.....	1¢ per lb. + 15%	} ----- 29.2%
	Unprocessed.....	1¢ per lb. + 10%	

NOTE.—The duty of 1 cent per pound is compensatory for the duty on jute fabrics (par. 1008) and was equivalent to 12 percent ad valorem in 1939. The higher duty applies only to jute bags that have been processed (bleached, printed, etc.); less than 1 percent of the 1939 imports of jute bags (in either quantity or value) were subject to the higher rate.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports ²	Apparent consumption	Ratio of imports to consumption
	Total ¹	Exports			
Quantity (1,000 pounds).....	330,000	24,227	30,490	336,255	Percent
Value (\$1,000).....	51,000	2,059	1,593		9
Unit value (per pound).....	\$0.155	\$0.086	\$0.052		
Persons employed (number) ⁴	4,000-6,000				

¹ Estimated.
² Does not include bags imported filled, or those imported empty if they had previously been exported filled.
³ Foreign value.
⁴ The relatively low unit value is accounted for by the inclusion of an undeterminable amount of used bags.

Jute bags are of two kinds, those made of hessian gunny cloth or burlap and those of sacking gunny cloth. Of these two jute fabrics, sacking gunny cloth is of coarser construction and is a much heavier material. It is considerably cheaper on a weight basis than hessian gunny cloth, with the result that jute bags made of sacking gunny cloth are substantially lower in price per pound than those of burlap. Both jute fabrics are produced chiefly in British India; sacking cloth is exported mostly in the form of bags, hessian as cloth.

Jute bags are made in the United States almost entirely from imported hessian gunny cloth. The bags are used as containers, principally for mill feeds, potatoes, fertilizers, sugar, flour, rice, wheat, and certain chemicals.

Most of the imported jute bags, which also come chiefly from India, are of sacking gunny cloth, and enter Puerto Rico and Hawaii, where they are used as containers for sugar, supplying the bulk of the total sugar-bag requirements of these islands. In 1939 about 83 percent of the jute bag imports represented entries into Puerto Rico and Hawaii. The large difference between the unit value of domestically produced and imported jute bags reflects chiefly the difference in price between the two jute fabrics. Exports of jute bags frequently almost equal the quantity imported. Ordinarily a considerable portion of the exports consists of second-hand bags (including bags both of foreign and of domestic manufacture) that had been used in the United States. The principal export markets are the Netherlands, Canada, Switzerland, Cuba, Chile, the Philippine Islands, and Peru.

POST-WAR SHORT TERM

Domestic production of jute bags will probably remain considerably larger during the years immediately following the war than in 1939. It is expected that the output of the products for which jute bags are used will continue at substantially the present high level, and that cotton bags during this period will be scarce as well as high in price.

The quantity of imported jute bags is not expected to change materially from what it was in 1939. Sugar production in Puerto Rico and Hawaii has shown little variation over a period of years, including the recent war years. The foreign value of the imports, however, may increase considerably. The unit value of imported bags in 1943 was about 80 percent greater than in 1939. Jute bag prices may remain much higher during the immediate post-war years than in 1939 because of the great demand for jute fabrics which seems likely to exist throughout the world during this period.

POST-WAR LONG TERM

Consumption in continental United States, is almost entirely supplied by domestic production. Taking into account the increase in population and assuming exports at about the same level as in 1939, if per capita income is the same as in 1939, consumption will probably be about 350 million pounds, with a value, at 1939 prices, of about 54 million dollars. If per capita income is 75 percent greater than in 1939, the demand for bags in continental United States and for exports might increase moderately and hence production might be 25 percent greater than in that year, amounting to about 410 million pounds. Prices would probably rise 10-15 percent, so that the value of production, including exports, might be about 72 million dollars. The increase would result both from greater shipments of products requiring bags, and from less re-use of bags.

The imports of bags, in quantity, will probably be about the same as before the war, and will be affected little if at all by changes in the national income, since it seems unlikely that there will be much change in the quantity of sugar produced in Puerto Rico and Hawaii, or in the quantity of bags imported for its shipment. The foreign price of bags, however, and consequently the value of imports, might be considerably higher than in 1939, depending on the world market for jute products and the merchandising policy of Indian producers. The foreign value of imports might thus be in the neighborhood of 2 million dollars.

The specific duty on jute bags (1 cent a pound) is designed to compensate manufacturers in the United States for the higher cost of raw material resulting from the duty on jute fabric. The ad valorem duty (10 or 15 percent), to some extent, may discourage the importation of burlap bags into the continental United States for sale in competition with those produced here, but it is scarcely restrictive of imports into Hawaii and Puerto Rico. A more important factor restricting imports into the United States, however, is the ability of the domestic manufacturer to fill an order promptly, and the ease with which he can print or otherwise mark the bags according to the requirements of the trade. For this reason, and because of the

specialized nature and destination of the imports, they probably would not be affected noticeably by an increase or a decrease of 50 percent in the duty.

Exports

Exports of jute bags in the post-war long term will probably constitute approximately the same proportion of domestic production as before the war, or about 7 percent of the quantity and 4 percent of the value. Such exports would then be about 23 million pounds per year, valued at about 2 million dollars with the national income at the 1938 level, and about 29 million pounds per year, valued at about 5 million dollars with the national income 75 percent above the 1939 level.

Employment

With income no higher than in 1939, the increase in the number of employees in the domestic industry would probably be slight, possibly 100 to 300. With a 75 percent increase in income, the increase might be 500 to 1,000 employees.

BAGGING FOR COVERING COTTON BALES

Tariff paragraph: 1019.

Commodity: Jute bagging for covering cotton bales.

Rate of duty: 15 to 32 oz. per sq. yd., *Equivalent ad valorem (1939): 11%*
 1/2¢ sq. yd.; (average).
 Over 32 oz. per sq. yd.
 1/2¢ per lb.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹ (total)	Imports	Apparent consumption	Ratio of imports to consumption ²
Quantity (million pounds).....	45.4	21.8	67.2	(1)
Value (\$1,000).....	2,059	715		
Unit value (per pound).....	\$0.045	\$0.033		

¹ Production in 1939 was only about half the normal output; with normal production, imports would have been about 20 percent of apparent consumption. See text.

² Exports not separately recorded, but believed to be negligible or nil.

³ Foreign value.

Jute bagging for covering cotton bales¹ is woven of coarse jute yarns, and is usually 45 inches wide (averaging 1.6 pounds per square yard). Six yards are customarily used in wrapping a bale of ginned cotton. A heavier jute bagging ranging in weight from about 2.5 to 4.0 pounds, and averaging 3.4 pounds per square yard is also used on cotton bales as compress labels or as patches. The total weight of jute fabric used on a cotton bale averages about 13 pounds.

In United States production of jute bagging, spinning and weaving are done in the same mill. Some yarns are made exclusively from

¹ In this discussion whenever "jute bagging" is stated, "jute bagging for covering cotton" is meant. Bag material for making bags and sacks is discussed under "burlap."

newly imported jute butts, while others are spun from mixtures of new butts with fiber recovered from old bagging, cordage, and the like. United States imports of jute bagging are almost wholly from British India (principally the 32-ounce fabric, which constitutes about 80 percent of jute bagging imports) and from the United Kingdom (principally the heavier fabrics). Imports in 1939 were fairly close to the average of the thirties, but production in 1939 was hardly more than half the average (83 million pounds) of the 5 census years, 1931, 1933, 1935, 1937, and 1939. Normally, imports account for about one-fifth of consumption.

About 60 percent of the consumption of cotton-bale covering is normally supplied by new and re woven jute bagging. The remainder consists of pieces of bagging salvaged from cotton-bale covering, used patches or compress labels, and discarded sugar bags which are slit open and used as bale covering. Much of this residual quantity is supplied by imports of "waste bagging and waste sugar sack cloth" (27 million pounds in 1939), which is imported free of duty (par. 1617).

Use of cotton fabric for bale covering, though subsidized, is limited. In this discussion it is assumed that new and re woven jute bagging will continue to be used as covering for about three-fifths of the cotton crop (averaging 13 pounds per bale), as in the past.

As the duty on bagging is low, it probably could be decreased or increased 50 percent with little effect on consumption. Changes in trade barriers throughout the world might have an effect on United States production of cotton and, in turn, on the consumption of jute bagging, but probably not sufficiently to exceed the ranges given in the estimates.

POST-WAR SHORT TERM

Consumption of new and re woven jute bagging immediately after the war, based on an assumed cotton production of 10-11 million bales, might be 75-85 million pounds. Of this amount, domestic production might supply about 60-65 million pounds and imports about 15-20 million.

POST-WAR LONG TERM

Consumption, Production, and Imports

Prices of jute bagging are likely to fluctuate with the general price level. With per capita income as in 1939, they might be about the same as in that year, say, 4.5 cents per pound for domestic production and 3 cents per pound (foreign value) for imports. With per capita income 75 percent greater than in 1939, the average price might be about 10 to 15 percent higher, about 5 cents per pound for domestic production and 3.4 cents per pound (foreign value) for imports.

Per capita income at 1939 level.

Consumption of new and re woven jute bagging might be 75-80 million pounds, of which production possibly would supply about 55-60 million, valued at approximately 2.5-2.7 million dollars, and imports about 20 million, with a total foreign value of about 0.6 million dollars.

Per capita income 75 percent higher than in 1939.

Because of the expanded market for raw cotton at such an income level, consumption of new and re woven jute bagging might be somewhat larger, amounting possibly to 90-100 million pounds. Produc-

tion might supply about 70-75 million pounds, valued at 3.5-3.8 million dollars, and imports might be 20-25 million pounds, valued at 0.7-0.9 million dollars (foreign value).

Employment

Although data are not available, it seems likely that employment would fluctuate closely with changes in domestic production.

LINOLEUM AND FELT-BASE FLOOR COVERING

Tariff paragraphs: 1020 and 1021 (part).

Commodity: Linoleum and felt-base floor covering.

Rate of duty: 25% to 32% ad val. *Average ad valorem (1939):* 26%

NOTE.—Pursuant to the trade agreement with the United Kingdom, effective January 1, 1939, the statutory rates of duty on these products were reduced as follows: Inlaid linoleum, from 42 to 22 percent ad valorem; other linoleum, from 35 to 25 percent ad valorem; and felt-base floor coverings, from 40 to 25 percent ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Linoleum:						<i>Percent</i>
Quantity (1,000 square yards).....	26,005	291	25,714	782	26,496	2
Value (\$1,000).....	25,422	172	25,250	1,344		
Unit value (per square yard).....	\$0.317	\$0.591	\$0.519	\$0.437		
Felt-base floor coverings:						
Quantity (1,000 square yards).....	168,887	1,678	164,889	2,891	168,780	2
Value (\$1,000).....	37,881	278	37,505	1,428		
Unit value (per square yard).....	\$0.227	\$0.224	\$0.227	\$0.115		
Persons employed (number).....	7,000					

¹ Foreign value.

Linoleum is made by applying to a jute burlap base, or to an asphalt-saturated rag felt base, a composition of oxidized linseed oil, cork, and other ingredients. It is made in various grades and thicknesses and also in special types such as the inlaid where the colors in the designs run through to the backing. Felt-base floor covering is made of asphalt-saturated rag felt painted on both sides and having printed designs on the upper or wearing surface. Felt-base floor covering, relatively cheap in price, is used in the United States in greater volume than all other floor coverings combined (wool, cotton, jute, linoleum, etc.).

In the United States linoleum and felt-base floor coverings are usually manufactured in the same factories. Felt-base floor covering production in 1939 was about evenly divided between piece goods and rugs. Linoleum, on the other hand, consists almost entirely of piece goods; about 75 percent of the production was of the inlaid type, and the remainder was principally of plain piece goods, which are made in heavier gages than the inlaid type.

United States imports of linoleum in 1939 were principally of lower priced plain piece goods in medium and light gages, although smaller quantities of inlaid piece goods were also imported; the 1939 imports

of felt-base floor coverings consisted principally of piece goods in grades which were inferior in quality to the United States product. These imports originated principally in the United Kingdom and the Netherlands.

Estimated post-war imports of felt-base floor coverings are based on the assumption that the imported product will generally be more comparable in quality to the domestic product than was true before the war. It is also believed that after the war a larger proportion of consumption than in 1939 might be supplied by imports, since the effect of the 1939 duty reductions were not yet reflected in the import figures for that year because of war preparations in Europe.

POST-WAR SHORT TERM

Government restrictions on the use of materials such as linseed oil and cork have operated to reduce substantially production in the United States of linoleum and felt-base floor coverings during the war. Imports have been negligible. The backlog of demand resulting from these conditions and the added demand resulting from the probably large construction of new houses, business establishments, and offices, indicates that for the first year or two after the war the consumption of linoleum might increase 100 percent, and that of felt-base floor coverings 50 percent, compared with 1939. Imports of both products are likely to be small, since the productive capacity in European countries will probably be less than in pre-war years, and the home demand in the producing countries will absorb the bulk of their production.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—Per capita consumption of linoleum would probably remain the same as in 1939. Taking account of increased population, total consumption might be about 10 percent greater than in 1939 and might amount to 40 million square yards. Imports would probably supply a considerably larger proportion of consumption than in 1939, for the reason that the reduction in duties, effective January 1, 1939, presumably did not influence imports in that year as much as might be expected in a normal peacetime year. Imports might amount to about 1.5 million square yards, with a foreign value (at 1939 unit prices) of close to \$700,000. Production for the domestic market would then be about 38.5 million square yards, valued at 31.5 million dollars.

Because of increased population, consumption of felt-base floor coverings might be 10 percent larger than in 1939 or 185 million square yards. The proportion supplied by imports would probably be about twice that of 1939 (for the same reason as just stated for linoleum) and might amount to 8 million square yards, with a foreign value (at 1939 unit prices) of about \$900,000. Production for the domestic market would then be about 177 million square yards, valued at 40.2 million dollars.

Duty reduced by 50 percent.—Consumption of linoleum might increase to 42 million square yards. Imports might be twice as large as with the duty unchanged and might amount to 3 million square yards, with

a foreign value of about \$1,375,000. Production for the domestic market would then be 39 million square yards, valued close to 32 million dollars.

Consumption of felt-base floor coverings would probably increase to about 200 million square yards. Imports might double compared with those under the duty as in 1939, and might be about 16 million square yards, with a foreign value of about 1.8 million dollars. Production for the domestic market would then supply 184 million square yards, valued at approximately 41½ million dollars.

Duty increased by 50 percent.—Consumption of linoleum might be 39 million square yards. Imports might be only half as much as with the duty unchanged, or 750,000 square yards, with a foreign value of about \$350,000. Production for the domestic market would then be 38½ million square yards, valued at 31½ million dollars.

Consumption of felt-base floor coverings might decline to 175 million square yards, and imports to 4 million square yards, with a foreign value of about \$450,000. Production for the domestic market would then be 171 million square yards, valued at 38.8 million dollars.

Per capita income 75 percent higher than in 1939.

There would be a tendency for people with higher incomes to replace linoleum and felt-base floor covering with more expensive materials, but any resulting decrease in their consumption would probably be more than offset by increased consumption of these types of floor coverings by people in the lower income groups. In the past the tendency under rising incomes has been for the consumption of both types of material to increase markedly, and for the consumption of linoleum to increase at a greater rate than that of the felt-base material. Prices would probably rise to the same extent as the general price level, i. e., 10 to 15 percent.

Duty as in 1939.—Consumption of linoleum might be 75 percent higher than with unchanged income, or about 70 million square yards. Assuming the same ratio of imports to consumption as with unchanged income, imports might amount to 2½ million square yards with a foreign value (at increased prices) of 1.3 million dollars. Production for the domestic market would then be about 67½ million square yards, with a value of 62.3 million dollars. Consumption of felt-base floor coverings might increase by 50 percent over that with unchanged income and amount to 275 million square yards. Imports might be 12 million square yards with a foreign value (at increased prices) of 1.5 million dollars. Production for the domestic market would then be about 263 million square yards, valued at 67½ million dollars.

Duty reduced by 50 percent.—Consumption of linoleum might increase to about 73.5 million square yards. Imports might be twice as high as with duty unchanged and amount to 5 million square yards, with a foreign value of about 2.6 million dollars. Production for the domestic market would then be 68.5 million square yards, valued at 63.2 million dollars. Consumption of felt-base floor coverings would probably increase to about 300 million square yards, and imports might increase to 24 million square yards, with a foreign value of about 3.1 million dollars. Production for the domestic market would then be about 276 million square yards, with a value of about 71 million dollars.

Duty increased by 50 percent.—Consumption of linoleum would probably decrease to about 68 million square yards. Imports might be 1½ million square yards, with a foreign value of about \$650,000. Production for the domestic market might be 66½ million square yards, valued at 61.6 million dollars. Consumption of felt-base floor coverings might decrease to 260 million square yards. Imports might be half the quantity with duty as in 1939 and amount to 6 million square yards, with a foreign value of about \$765,000. Production for the domestic market would then be about 254 million square yards, valued at 65.2 million dollars.

Exports

In 1939 exports constituted less than 1 percent of United States production of both linoleum and felt-base floor covering. The ratio of exports to production would probably not change appreciably after the war at the assumed 1939 level of income. With world income assumed to be 75 percent higher, exports might be somewhat larger.

Employment

Employment in the long-term post-war period with national income at the 1939 level might be 7,300–7,800 persons. With a per capita income 75 percent greater than in 1939, the number of employed would probably be 11,000–12,000.

JUTE FLOOR COVERING

Tariff paragraph: 1021.

Commodity: Jute carpets, carpeting, mats, matting, or rugs.

Rate of duty: 35 percent ad valorem.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 square yards).....	1, 193
Value (\$1,000).....	1 858
Unit value (per square yard).....	\$0.72

1 Foreign value.

Imports of jute floor coverings in 1939 (principally from Belgium, France, and Italy) consisted almost entirely of imitation oriental rugs made of jute, of which there was no known United States production in that year. Practically the only United States products which were similar in design and appearance to imported jute rugs were wool rugs, but the much higher quality and price of the domestic rugs was such as to render them practically noncompetitive with the imported products.

POST-WAR SHORT TERM

Demand will probably be abnormally high in view of the shortage of supply during the past several years. If jute floor coverings are obtainable abroad in adequate quantities, which is uncertain, imports might be two or three times the quantity imported in 1939.

POST-WAR LONG TERM

Per capita income at 1939 level.

It is assumed in making the following estimates that consumption would increase 10 percent owing to the increase in population and, as in the past, that there will be no domestic production or exports.

Duty as in 1939.—Imports probably would reach 1½ million square yards per year, with a foreign value of about \$950,000.

Duty reduced by 50 percent.—Imports might amount to 1½ million square yards, with a foreign value of about 1.1 million dollars.

Duty increased by 50 percent.—Imports might amount to about 1.2 million square yards, with a foreign value of about \$850,000.

Per capita income 75 percent higher than in 1939.

On the basis of past experience, such an increase in per capita national income would materially increase imports and, therefore, consumption. The unit value might increase by 10–15 percent above the 1939 unit value, in line with the assumed increase in the general price level.

Duty as in 1939.—Imports might be about 2 million square yards, with a foreign value of 1.6 million dollars.

Duty reduced by 50 percent.—Imports probably would amount to about 2¼ million square yards, with a foreign value of 1.8 million dollars.

Duty increased by 50 percent.—It is likely that imports would amount to about 1¾ million square yards, with a foreign value of about 1.4 million dollars.

FLOOR COVERINGS, NOT ELSEWHERE SPECIFIED

Tariff paragraph: 1021.

Commodity: Other floor coverings, not elsewhere specified.

Rate of duty: 40 percent.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 square yards).....	3,000	738	3,738	Percent 20
Value (\$1,000).....	2,500	\$ 495		
Unit value (per square yard).....	\$2.83	\$2.67		

¹ No reported exports. Figures given are estimates.

² Foreign value.

The items included in this statement consist of miscellaneous types of floor coverings and exclude those of (1) grass or rice straw; (2) wool, cotton, jute, and similar fibers; and (3) hard surface types. The types of floor coverings imported under this statistical classification change more or less from year to year. Most of the 1939 imports consisted of sisal rugs, cocoa-fiber rugs, rush rugs, sea-grass rugs, and rag rugs made of material other than cotton. The rag rugs

were predominantly of small sizes and practically all of the consumption was supplied by imports, principally from Japan. All the other imported rugs included in this section were floor coverings for use in the summer months and came principally from Belgium, the Netherlands, British India, and China. The total United States production of summer rugs is substantial and, although not reported in detail, has in the years immediately preceding the war consisted principally of "fiber" (paper yarn) and sisal rugs.

POST-WAR SHORT TERM

Because a shortage of all kinds of floor coverings has developed during the war, it is likely that in the first few years following the war demand for these rugs will be considerably higher than in 1939 and that both production and imports may be twice as great. It is possible that prices will be one-third higher. The value of production would then be almost 7 million dollars and the foreign value of imports a little over 1 million dollars. The estimate concerning imports is based on the assumption that the floor coverings will be available from foreign sources.

POST-WAR-LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

With a 10 percent increase in population, consumption probably would increase proportionately, to about 4 million square yards per year. Consumption would presumably be affected somewhat by a 50 percent change in the duty in either direction, but not sufficiently to warrant separate estimates.

Duty as in 1939.—Assuming that imports and production would supply consumption in the same proportions as in 1939, imports would amount to about 800,000 square yards, with a foreign value of about \$535,000 at 1939 prices. The remaining 3.2 million square yards would be supplied by production and would be valued, on the basis of 1939 prices, at about 2.7 million dollars.

Duty reduced by 50 percent.—Imports would probably increase and might amount to approximately one-fourth of consumption, or 1 million square yards, with a foreign value of almost \$700,000. Production would then amount to 3 million square yards, valued at about 2.5 million dollars.

Duty increased by 50 percent.—Imports would probably supply a much smaller proportion of consumption, say 500,000 square yards, with a foreign value of \$335,000. Production would then amount to 3½ million square yards, valued at about 2.9 million dollars.

Per capita income 75 percent higher than in 1939.

The effect of the higher income level might be to increase consumption by 50 percent above that at the lower income level or to about 6 million square yards. Values shown in the following estimates have been calculated on the basis of unit value 10–15 percent higher than those prevailing in 1939, in parallel with the assumed general rise in prices with a great increase in national income.

Duty as in 1939.—Imports would supply perhaps 20 percent of consumption, or 1.2 million square yards, the foreign value of which

would be about \$900,000. Production would then amount to 4.8 million square yards, valued at almost 4½ million dollars.

Duty reduced by 50 percent.—Imports might supply one-fourth of consumption, or 1¼ million square yards, with a foreign value of about 1.1 million dollars, leaving 4¼ million square yards, valued at about 4.2 million dollars, to be supplied by production.

Duty increased by 50 percent.—Imports would probably supply about 750,000 square yards, with a foreign value of \$570,000. Production would then amount to 5¼ million square yards, valued at about 4.9 million dollars.

Exports

Post-war exports of rugs of the types here considered are likely to be negligible, as in the past.

Employment

Information is not available regarding the number of persons employed in the United States in the manufacture of these floor coverings. The number employed would probably range between 5 and 10 percent from the 1939 level under the changes in production likely to be caused by changes in imports under the different rates of duty and levels of national income.

WASTE BAGGING, ETC.¹

Tariff paragraph: 1617.

Commodity: Waste bagging and waste sugar sack cloth, except for paper making.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939¹ are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	1 90.0	(?)	1 90.0	2 25.6	114.6	Percent 28
Value (\$1,000).....	1 1,800	.....	1 1,800	4 584	.....	.....
Unit value (per pound).....	1 90.00	.....	1 90.00	90.022	.....	.....

¹ Estimated.

² Negligible.

³ The imports for 1939 were substantially below the pre-war average; see text below.

⁴ Foreign value.

Waste bagging and waste sugar-sack cloth are recovered from bagging which has been used to cover cotton bales or to contain sugar or other materials. The sacks or bags are slit open to make the cloth available for new uses. About half of this material is reconditioned and used for covering cotton bales. The remainder is shredded to recover the fiber, some of which is then spun (either alone or mixed with jute butts) into yarn. The yarn is woven mostly into bagging for covering cotton bales, and the residue is used to make jute felts, packings, insulations, and waddings.

¹ The term "waste bagging" is here used to mean waste bagging and waste sugar cloth.

Waste bagging is free of duty. Imports in 1939 (principally from the United Kingdom, France, Canada, Belgium, and the Netherlands) were unusually low and amounted to 27 million pounds, compared with 48 million pounds for the annual average of the period 1931-40. Similarly the quantities collected from domestic sources in 1939, and therefore also consumption, were substantially below the average for the preceding decade.

The collection and accumulation of the items which make up the waste are subject to many variables. Amounts available for collection depend largely on the consumption in the preceding season of other commodities such as cotton and sugar. Price is the chief factor influencing thoroughness of the collection. Because this waste is relatively cheap and bulky, transportation charges may account for such a large proportion of the cost that the requirements of industries nearest the areas where the waste accumulates are more likely to be filled. For these reasons, the estimates given below should be assumed to be only rough approximations.

POST-WAR SHORT TERM

The demand for waste bagging immediately after the war will probably be strong, and will therefore probably insure the ready disposal of whatever supplies are available. Consumption might reach 150-200 million pounds a year, of which domestic sources might supply 100-130 million pounds and imports the balance.

POST-WAR LONG TERM

Consumption, Production, and Imports

The values of the products from which these wastes are derived and upon which their value is generally dependent, would most likely fluctuate with the general price level. At per capita income at 1939 levels, the average unit value might be about 2 cents per pound, and with per capita income 75 percent greater than in 1939, it might be about 2.5 cents per pound, for both domestic sources and imports.

Per capita income at 1939 level.

Consumption of waste bagging might be substantially above the abnormally low 1939 level and might total 130-150 million pounds. Of this quantity domestic sources might supply about 85-95 million pounds, or approximately the same proportion (about 65 percent) of consumption as before the war, valued at 1.7-1.9 million dollars, and imports might be 45-55 million pounds, with a total foreign value of 0.9-1.1 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of waste bagging might be somewhat higher than with no change of income, i. e., possibly 7 percent higher, or about 140-160 million pounds. Domestic sources might supply 90-100 million pounds, valued at 2.2-2.5 million dollars; and imports might be about 50-60 million pounds, with a total foreign value of about 1.2-1.5 million dollars.

BINDING (BINDER) TWINE

Tariff paragraph: 1622.
 Commodity: Binding (binder) twine.
 Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (million pounds).....	124.1	4.1	120.0	50.0	170.0	Percent 29
Value (million dollars).....	\$ 5.1	0.2	4.9	\$ 2.4		
Unit value (per pound).....	\$ 0.058	\$ 0.054	\$ 0.059	\$ 0.049		
Persons employed (number).....	1,500-2,000					

¹ Including 36 million pounds produced in penal institutions, value not reported.
² Value of the 88 million pounds produced by private manufacturers.
³ Foreign value.

Binder twine is used by farmers in harvesting operations. Consumption in the United States showed a decided downward trend during the thirties and in 1939 was about 25 percent less than in 1929. The decline resulted partly from the increased use of the combined harvester-thresher, and partly from the growing practice of cutting corn ensilage in the field, which reduced the demand for binder twine; there was also a decrease in the production of certain grains. Although the use of binder twine increased during the war, the pre-war downward trend is likely to continue after the war.

In 1939 approximately 50 percent of the United States supply (170 million pounds) was obtained from private domestic manufacturers, about 20 percent from prison production, and about 30 percent from imports. United States production of binder twine by both private manufacturers and penal institutions was lower in 1939 than in any other census year since 1909.

Binder twine is manufactured in the United States principally from henequen fiber, all of which is imported almost exclusively from Mexico and Cuba. Imports of binder twine are obtained largely from Mexico, Cuba, Canada, and, before the war, the Netherlands.

POST-WAR SHORT TERM

Under the assumption that a high level of agricultural production will continue, consumption of binder twine will remain at approximate wartime level. This level seems likely since any considerable supplies of farm machinery of the type which might reduce the demand for this material probably will not be available immediately. Consumption of binder twine might be somewhat greater than in 1939, might total 175-200 million pounds a year. Under these circumstances domestic production by private manufacturers possibly would be 80-100 million pounds, imports 50-70 million pounds, and the remainder would be supplied by production in prisons.

POST-WAR LONG TERM

Consumption, Production, and Imports

Consumption of binder twine, because of its tendency in the past to decline, probably will not be greater than in 1939, notwithstanding population growth. The level of per capita income would not be a material factor; whatever increase (probably small) might occur at a higher level of income in the production of crops requiring binder twine probably would be offset by the stimulus given to the sale of machinery which reduced the demand for this material. It is probable that consumption will level off at 160-180 million pounds a year. Of this amount, from 80-90 million pounds might be supplied by private manufacturers, 50-60 million pounds by imports, and the rest, 20-30 million pounds, by manufacture in prisons.

Per capita income at 1939 level.

On the assumption of a 1939 national income level, the price of binder twine in the long-term post-war period, although it might be higher than the price in 1939, would probably not be higher, and might be lower, than the average price during 1934-39. This prediction is on the assumption that, for reasons already discussed, total consumption of binder twine in the United States will probably decline. Thus the unit value of the domestic product would perhaps be 7-8 cents a pound, and the foreign unit value of imports 6-7 cents. Under these circumstances, the value of production by private manufacturers might be 5.5-7.0 million dollars and the foreign value of imports, 3-4 million.

Per capita income 75 percent higher than in 1939.

Assuming an increase of 75 percent in the national income, the demand for binder twine would not be appreciably affected, but the costs of production would probably be increased by reason of the higher general price level. It is quite possible, therefore, that the price of binder twine would be somewhat higher than in the late thirties, this notwithstanding a probable decline in consumption. The value of domestic production might be 6-8 million dollars and the foreign value of imports 3.5-4.5 million.

Exports

Exports for a number of years have been small in comparison with production and imports and probably will remain so regardless of any changes which may occur either in per capita income or in commercial policy.

Employment

It appears likely that in the long-term period the number of employees will decline, perhaps 5 to 10 percent below the 1939 level.

COIR YARN

Tariff paragraph: 1656.
Commodity: Coir yarn.
Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	4,619
Value (\$1,000).....	124
Unit value (per pound).....	\$0.027

¹ Foreign value.

Coir yarn is made of coir, a fiber obtained from the husk of the unripe coconut and sometimes referred to as cocoa fiber. The yarn is usually spun by hand. British India is the principal source of United States imports. Coir yarn is used in the United States in the manufacture of cocoa (coir) mats and matting and, to a minor extent, in cordage. The mats are used at entrance doorways, at golf tees, in the pits of bowling alleys, and so on. The matting is used as runners in aisles, corridors, offices, and as porch rugs. During World War II coir yarn has been diverted to the manufacture of boat fenders and cordage, where a high degree of resistance to water rotting is desired. Coir yarn is not produced in the United States.

Imports of coir fiber (averaging about \$30,000 in foreign value annually in the 10 years, 1930-39) are partly the coarser, stiffer fibers used for bristles in brushes, and partly very short fibers used in stuffing for upholstery.

POST-WAR SHORT TERM

Since the start of the war, only small amounts of the usual coir yarn products have been made. Replacements of worn-out mats will be needed, and to supply these it is probable that imports of coir yarn will be high, possibly 6-10 million pounds.

POST-WAR LONG TERM

Coir yarn is duty-free, but products made from it are dutiable. The equivalent ad valorem of the specific duty on cocoa fiber mats, the chief item in which coir yarn is consumed domestically, averaged about 150 percent in the period 1934-39. A decrease of 50 percent in the duty on coir products would result in a sharp rise in imports of such products with a consequent fall in imports of coir yarn, and conversely an increase of 50 percent in duties would result in smaller imports of coir products and larger imports of coir yarn.

Average annual unit value (foreign) during 1935-39 ranged between 2.7 and 3.2 cents. It is assumed that a similar range, perhaps averaging about 3 cents per pound, might be expected in the long-term period with per capita income as in 1939, and perhaps about 3.5 cents at the assumed higher income level.

Per capita income at 1939 level.

Imports of coir yarn would probably be about the same as in 1939, or 4.5 million pounds, valued at about \$135,000 (foreign value). Any rise or fall in imports of coir yarn which would occur with an increase or decrease of the duties on finished coir products (especially mats and matting), would be partly or wholly offset by compensating changes in imports of these products, so that total imports of coir, in partly or wholly manufactured form, would probably not be greatly affected by changes of 50 percent in the duty in either direction.

Per capita income 75 percent higher than in 1939.

Consumption of coir products would probably be materially larger because of building expansion and the additional requirements for recreational activities.

Imports of coir yarn, assuming unchanged duties on mats and other coir manufactures, would probably be about 7.5 million pounds, valued at approximately \$260,000 (foreign value).

SISAL AND HENEQUEN

Tariff paragraph: 1684.
 Commodity: Sisal and henequen.
 Rate of duty: Free.

GENERAL

Data on United States imports less re-exports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	226,000
Value (\$1,000).....	17,160
Unit value (per pound).....	\$0.032

¹ Foreign value.

Sisal and henequen are botanically related, hard (leaf) fibers; they are not produced in the United States. Henequen is imported almost exclusively from Yucatan (Mexico), which has a virtual monopoly, and is normally used almost exclusively in the manufacture of binder (harvester) twine, most of which is made therefrom. Most of the sisal imports ordinarily come from Java, British East Africa, and Haiti. After 1941, when imports of sisal from Java were suspended, substantial quantities were also supplied by Portuguese East Africa. Before the war considerable quantities of sisal were used in binder twine, but its chief uses were in wrapping twines, in padding for upholstery, and for mattresses. During the war, however, sisal has been substituted extensively for abacá (manila) in rope making, since the supply of abacá (chiefly from the Philippines) was cut off after 1941.

The total amount of henequen and sisal used for binder twine was declining before the war, owing to greater imports of the manufactured product and to the increasing use of the combine-harvester, which obviates the need for binder twine. In addition, increasing amounts of sisal were being used for binder twine. As a result of all these factors the imports of henequen had fallen well below earlier levels. Diminishing requirements for twine in harvesting were, however, so far as it concerns the total consumption of henequen and sisal, approximately offset by the increased use of sisal for other purposes, particularly wrapping twine, so that the average annual total imports of the two fibers during 1936-40 were not much below those of the late twenties. Because of the greatly increased use of sisal for rope during the war, the amount available for the accustomed purposes has been inadequate, and consumption, particularly for wrapping twine, has been curtailed.

POST-WAR SHORT TERM

When the war is over, an active demand for sisal and henequen probably will continue for several years because of a high level of agricultural and industrial activity in that period, and because of the time that may be required to reestablish fully production of abacá in the Far East. United States imports are expected to be large, and may be 400-500 million pounds valued (at prices much higher than in 1939) at 20-30 million dollars a year.

POST-WAR LONG TERM

Per capita income at 1939 level.

The probable further decline in the total quantity of sisal and henequen used for binder twine may not be fully offset by the increased use of sisal for wrapping twine and other purposes; taking account of increase in population, total consumption and imports may be 250-300 million pounds a year. The unit value of imports of the two fibers combined probably will be reduced sharply from its present high level (6.6 cents a pound in 1943), when supplies of sisal and other hard fiber from the Far East again enter trade channels in substantial volume. A composite unit value approximately the same as in the 4 years 1937-40 (4 cents a pound, which was considerably higher than in 1939) may be expected, indicating a foreign value of imports of 10-12 million dollars a year.

Per capita income 75 percent higher than in 1939.

The total consumption of sisal and henequen in binder twine would not be significantly larger with a higher than with a lower national income. Consumption of these fibers in wrapping twine and other uses, particularly upholstery, on the other hand, would be considerably larger under a higher national income. Total United States consumption and imports of sisal and henequen might be 350-400 million pounds. Unit values would probably be higher than in 1937-40, so that the total value of the imports might be 17.5-20.0 million dollars a year.

MANILA (ABACÁ) FIBER

Tariff paragraph: 1684.

Commodity: Manila (abacá) fiber.

Rate of duty: Free.

GENERAL

Data on United States imports less reexports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	97, 359
Value (\$1,000).....	1 3, 869
Unit value (per pound).....	\$0. 04

¹ Foreign value.

Manila (abacá) fiber is used in the United States largely in the manufacture of rope. It is also an important fiber for the manufacture of certain special paper products. The entire supply is imported, and before the war nearly all of it came from the Philippine Islands. With the removal of this source during 1942 the United States became dependent almost entirely on stocks and on substitute materials, chiefly sisal.

Imports of abacá are received both as fiber (the category here under consideration) and as rope. In the past, imports of fiber have represented about 90 percent of the imports of abacá in all forms.

During the war, abacá fiber plantations have been developed in Central America. These plantations comprise about 28,000 acres, and it is estimated that they will yield 45-50 million pounds of fiber in 1945, equal to 60-70 percent of the annual consumption in the United States cordage industry in 1935, 1937, and 1939. There is no way of forecasting how this production will be affected by the restoration of the Philippines as a source of manila.

POST-WAR SHORT TERM

The quantity of abacá fiber imported probably will depend more on the quantity available than on the demand. Even should production in the Philippine Islands be resumed soon after the war and production in Central America develop as expected, the world demand for the fiber probably still will be in excess of the supply.

If such an amount could be obtained, the United States would probably import some 225 million pounds of abacá fiber a year, or $2\frac{1}{2}$ times the 1939 imports. This presumes a high level of activity in the manufacture of manila rope, both for current needs and to replace the less-preferred cotton, jute, henequen, and sisal rope which have been used in substitution for abacá rope during the war, and of other products in which this fiber is used. The price is likely to be much higher than in 1939 with the result that the value of imports, if so much proves to be obtainable, might be as great as 23 million dollars a year, or even more.

POST-WAR LONG TERM

Imports

The estimates of imports of abacá fiber, which follow, are related to those made elsewhere of the production of hard fiber rope in the United States.¹ The imports and consequently the production of hard fiber rope would be affected by a change in the import duties. A reduction of 50 percent in the duty might cause the imports of abacá to be about 6 percent less, and an increase of 50 percent in the duty on rope might cause them to be 3 percent greater, than they would if the duty were unchanged. As these differences are small, they are not given detailed consideration in the estimates below.

Per capita income at 1939 level.

The price of abacá fiber may return to about the same level as in 1939. The quantity of imports might well be considerably greater than in that year because of the increased requirements of hard fiber products, especially of manila rope, to supply an expanded Navy and Merchant Marine. They might be as much as 40 percent greater in quantity and 50 percent greater in total value, i. e., about 135 million pounds, with a foreign value of perhaps 6 million dollars a year.

Per capita income 75 percent higher than in 1939.

The use of abacá fiber would probably be about one-fifth larger than with national income the same as in 1939. Imports might therefore, be in the neighborhood of 160 million pounds, valued at about 7 million dollars a year.

ISTLE

Tariff paragraph: 1684.

Commodity: Istle, unmanufactured.

Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (million pounds)	23.3
Value (\$1,000)	1.685
Unit value (per pound)	\$0.029

¹ Foreign value.

¹ See statement for paragraph 1006 (a) (1), Hard-fiber ropes.

Four different types of istle, or Tampico fiber, are imported for consumption: Tula and jaumave (obtained from agave plants) which are used chiefly in the manufacture of brushes; and palma (from the palma barreta plant) and pita (a yucca), which are used mostly for cordage, particularly twines, and as filling for upholstery.

Mexico is the sole source of United States istle imports of which about half are used, under normal conditions, in the manufacture of brushes. About 90 percent of the istle fiber imported for brush purposes enters in the crude or unmanufactured state. United States imports in the decade 1930-39 ranged between a low of 13 million pounds (1938) and a high of 25 million pounds (1930), and averaged about 19 million pounds.

In order to meet increased wartime demands, imports of istle reached 51 million pounds in 1942, but they declined to 37 million pounds in 1943 and to 33 million pounds in 1944. During World War II, a larger proportion of the istle supply has been allocated to the manufacture of cordage than formerly. In addition to twine made wholly of istle fiber, increasingly large quantities of twine have been made of jute and istle mixtures. Synthetic fibers have not been, as yet, directly competitive with istle but might be in the long term.

Although unmanufactured istle fiber is duty-free, the products in which it is consumed are dutiable when imported, and any general change in their duty status might cause a shift in imports of istle fiber and istle products from one to the other.

POST-WAR SHORT TERM

Imports of istle are likely to continue high, possibly in the range of 30-40 million pounds. Brush requirements in particular will probably be high, and istle might also share in the increased demand for wrapping twines which will probably arise immediately after the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Assuming that the trend toward the increased use of vegetable brush fibers will continue, imports of istle might be in the neighborhood of 25 million pounds annually, or about 30 percent above the annual average of the period 1930-39. Istle prices may be expected to fluctuate with the general price level. At an assumed foreign price of 3 cents per pound the total foreign value of imports would amount to about \$750,000.

Any rise or fall in imports of istle which might occur with an increase or decrease of the duties on the dressed istle and other products in which it is consumed, might be partly, or possibly more than, offset by compensating changes in imports of these products.

Per capita income 75 percent higher than in 1939.

Consumption of istle would probably be larger than with no change in income, because of the increased use of brushes and of furnishings in connection with the expansion of building and of recreational activities. Some of these gains might be offset, however, by shifts to other vegetable fibers of higher quality, to animal fiber, or to synthetic fibers in the manufacture of brushes. Jute and sisal might

replace substantial quantities of the istle fiber in the manufacture of wrapping twines.

Imports might reach 30 million pounds which, at an assumed foreign price of 3.5 cents per pound, would amount to a total foreign value of about \$1,050,000. In this case also, variations in imports of istle attributable to a change in the duty on istle manufactures might be partly, or probably more than, offset by compensating changes in imports of istle products.

MAGUEY

Tariff paragraph: 1684.
Commodity: Maguey or cantala.
Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (long tons).....	1,945
Value (\$1,000).....	162
Unit value (per ton).....	\$83

Percentages:

Maguey, or cantala, one of the minor fibers used in the United States in the production of cordage, particularly wrapping twine, is a hard (leaf) fiber obtained from the same family (*Agave*) which yields sisal and henequen. Principal sources of imports are the Netherlands Indies and the Philippine Islands.

The quality of Philippine maguey has deteriorated considerably chiefly because, in the preparation of the fiber, the less troublesome salt-water retting has practically supplanted the much more desirable machine-cleaning method. Unless efforts to improve the Philippine maguey are more successful than in the last 10 or 15 years, it appears doubtful whether Philippine maguey, though cheap, will be able to compete with other cordage fibers.

In contrast to the Philippine product, the Netherlands Indies product, known as "cantala," has maintained its quality, and the Netherlands Indies has become the chief source of United States imports. Java cantala is finer and softer, though weaker, than sisal. Efforts to use it in the manufacture of binder twine have not been very encouraging.

The total quantity of cantala and maguey imported is a very minor factor in the materials used in the cordage industry. The small imports are subject to relatively wide variation both in quantity and price, depending on the conditions of supply of the more important cordage materials. Cantala from the Netherlands Indies has on the average been higher priced than sisal or henequen, but the average unit value of maguey and cantala taken together, probably on account of wide variations in quality, has fluctuated much more widely than that of sisal or henequen. In quantity the annual imports of maguey and cantala in the period 1930-39 have ranged from 153 tons (1932) to 2,564 tons (1936). The average was 1,156 tons and the average unit value for the entire period was \$88 per ton.

POST-WAR SHORT TERM

Fiber needs will be large and any acceptable fiber will most likely be in strong demand. Under these circumstances imports of cantala may reach 2,500-3,000 long tons, with a foreign value of probably \$250,000-\$300,000.

POST-WAR LONG TERM

Per capita income at 1939 level.

Annual imports, although probably subject to wide variation from year to year, might under such a level of national income average about 1,500 tons. Probably most of these imports would be from Java or, if from the Philippines, would be of improved quality equivalent to the Javanese product. If this is the case, the average unit value of the imports might range from \$80 to \$100 per long ton. The range of the value of imports might, therefore, be from \$120,000 to \$150,000 (foreign value).

Per capita income 75 percent higher than in 1939.

At this level of income, imports of maguey or cantala would again probably be subject to wide variation but might average 2,000 tons per year. The unit value of imports would probably be about \$100 a ton and thus the value of imports would be \$200,000 (foreign value).

PALM-LEAF FIBERS, N. S. P. F.

Tariff paragraph: 1684.

Commodity: Palm-leaf fibers, unmanufactured, principally palmyra, piassava and African bass.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds).....	700	5,300	6,000	Percent
Value (\$1,000).....	70	205		
Unit value (per pound).....	\$0.10	\$0.039		

¹ There are no exports.
² Estimated.
³ Foreign value.

Palm-leaf fibers are obtained from the leaves of various species of palm, which grow uncultivated in many tropical and semitropical countries. United States imports of unmanufactured or crude palm-leaf fiber consist principally of African bass from West Africa, palmyra and bassine from India, and piassava from Brazil. These are used chiefly in the manufacture of brushes and brooms.

Palm-leaf fibers of the types which are imported are not produced in the United States. A competitive fiber, palmetto, is produced domestically, but no palmetto fiber is imported. Palmetto is marketed dressed or prepared for brush-making and not in a crude or unmanu-

factured state. Palm-leaf brush fibers, including palmetto, compete with certain other brush fibers of vegetable origin (chieflyistle) and, to a limited extent, with animal hairs. The latter, however, have usually been considerably higher in price. Synthetic fibers have not been, as yet, directly competitive with palm-leaf fibers but may become competitive in the long-term post-war period.

Although unmanufactured palm-leaf fiber is duty-free, the products made therefrom are dutiable when imported either in a partly manufactured or finished form. A 50-percent decrease or increase in the duty on palm-leaf fiber products would probably cause compensatory increases or decreases in the imports of palm-leaf fiber. Inasmuch as the duties on the more important fiber products are relatively small (20 percent ad valorem in 1939), these shifts would probably not be substantial and are therefore disregarded in the following estimates.

POST-WAR SHORT TERM

Imports of palm-leaf fibers, which attained the record of 8.4 million pounds in 1943, will most likely continue high because brush supplies are low and requirements are expected to be high. Imports may be in the range of 9-10 million pounds.

POST-WAR LONG TERM

Consumption, Production, and Imports

The use of vegetable brush fibers had been increasing in the decade before the war and is likely to increase even more rapidly in the future because of the shortage of nonvegetable brush materials. In view of this increasing consumption, imports of palm-leaf fibers are likely to increase.

Palm-leaf fiber prices may be expected to fluctuate with the general price level. With per capita income as in 1939, the average unit foreign price of imports might be about the same as in 1939, or 4 cents per pound, and that of domestic production might be about 10 cents per pound. With per capita income 75 percent greater than in 1939, the foreign price of imports might be about 4.5 cents per pound and that of the domestic output might be about 11.5 cents per pound.

Per capita income at 1939 level.

Allowing for increased population, consumption of palm-leaf fibers might be 15-20 percent higher than in 1939, or about 7.0 million pounds, of which imports might be about 6 million pounds, which at the assumed unit price would have a foreign value of \$240,000. Domestic production might be about 1 million pounds, valued at approximately \$100,000.

Per capita income 75 percent higher than in 1939.

Consumption of palm-leaf fibers would probably be substantially larger under a high national income because of the greater use of brushes of all kinds; consumption might be perhaps in the neighborhood of 10 million pounds, of which imports might supply about 8.5 million pounds, which, at the assumed unit price of 4.5 cents per pound, would have a foreign value of about \$380,000. Domestic production would then be about 1.5 million pounds, valued at approximately \$175,000.

Exports

United States exports of palm-leaf fiber are not separately recorded but are probably negligible, and are likely to be so after the war.

Employment

Although data are not available, it seems probable that employment would move closely with changes in domestic production.

JUTE FIBER

Tariff paragraph: 1684.

Commodity: Jute fiber, unmanufactured.

Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (million pounds).....	79.1
Value (million dollars).....	3.6
Unit value (per pound).....	\$0.045

† Foreign value.

Jute, a bast fiber, is one of the cheapest and, with the exception of cotton, the most extensively used of all textile fibers. Virtually the entire commercial supply of jute originates in British India. The fiber is not produced in the United States. Some of the imported jute fiber is made into packing and electrical rove but most of it is spun into yarn. These yarns are used principally in the foundation fabric of wool carpets, in the manufacture of wrapping twines, and in reinforcing paper; comparatively smaller amounts are used in weaving webbings and paddings (interlinings). As there is no commercial production of burlap in the United States, no imported jute fiber goes into burlap.

Imports of jute fiber have fluctuated widely, ranging during the thirties from a low of 63 million pounds in 1932 to a high of 206 million pounds in 1937, and averaging 109.5 million pounds per year. Actual consumption, however, has varied in a more narrow range, the marked changes in imports being associated mainly with changes in inventories. Average foreign value per pound was between 4.1 and 4.5 cents per pound in the period 1936-39.

During the present war, jute rope has been employed extensively to supplement the restricted supply of hard-fiber rope, but this use will probably be sharply reduced after the war. Jute wrapping twines are in limited competition with hard-fiber and cotton twines. In the remaining large uses in which jute is consumed in the United States, it meets little or no direct competition. Some development of paper yarns for use in place of jute carpet yarn has occurred during the war and may possibly be a competitive factor in the long term. In some of the minor uses, however, particularly for webbings and interlinings, other fibers can be used.

Imports of jute fiber are free of duty. A general decrease in duties would probably increase imports of most of the jute manufactures (particularly yarns and twines) in which jute fiber is consumed in the United States and hence reduce the consumption of jute fiber. A general increase in duties, on the other hand, probably would have only a minor effect on jute fiber consumption, as imports of those jute

products which might be reduced substantially (webbing and interlinings), constitute only a small proportion of the total imports of jute fiber and manufactures.¹

POST-WAR SHORT TERM

Consumption of jute fiber probably will be high because of large requirements for carpet yarns, production of which was cut off entirely by the war, as well as for twines, webbing, and other products of jute. Imports of jute fiber might reach 300 million pounds, or 150 percent above 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

As in the pre-war years, jute prices may be expected to fluctuate with the general price level. With per capita income as in 1939, the average foreign price of imports might be about the same as in 1939, say 4.5 cents per pound. With per capita income 75 percent greater than in 1939 it might be about 5 cents per pound.

Per capita income at 1939 level.

Per capita consumption of jute manufactures (of the kinds in which the fiber is used in the United States) would be about at the same level as in the thirties. Losses which may be expected by diversion of some carpet yarn production from jute to paper might be offset by gains in other uses, particularly in yarns for reinforcing paper, and electrical rove.

Duties as in 1939.—Total imports of jute fiber, if the duty on jute manufactures remains unchanged, might be about 120 million pounds (or about 10 percent above the average for 1930–39, by reason of increase in population), with a total foreign value of about 5.4 million dollars.

Duties reduced by 50 percent.—Increased imports of jute manufactures, with a consequently smaller United States jute consumption, might reduce jute imports sharply, possibly to 60 million pounds (about 50 percent less than with the duty unchanged), with a total foreign value of about 2.7 million dollars.

Duties increased by 50 percent.—Only a relatively small decrease in the importation of jute manufactures would be likely under such rates of duty. Imports of jute would probably be in the neighborhood of 125 million pounds, with a total foreign value of 5.6 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of jute products might rise moderately, owing chiefly to the increased use of carpet yarns.

Duties as in 1939.—Imports of jute might be about 140 million pounds (or about 15 percent higher than with no change in income) and be valued at about 7 million dollars (foreign value).

Duties reduced by 50 percent.—As specific duties on the yarns should have a less restrictive effect when values are higher, the reduction in the United States jute consumption, owing to increased imports of jute manufactures, might be relatively smaller than at the lower income level. Imports of jute may be in the neighborhood of 90 million pounds, with a total foreign value of about 4.5 million dollars.

Duties increased by 50 percent.—Imports of jute might be about 145 million pounds, with a total foreign value of about 7½ million dollars.

¹ See sections on jute webbing and jute paddings and interlinings in this series.

KAPOK

Tariff paragraph: 1684.
Commodity: Kapok.
Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (long tons).....	9,400
Value (\$1,000).....	2,336
Unit value (per long ton).....	\$249

1 Foreign value.

Kapok is a soft, lustrous floss obtained from the seed pods of a tree widely distributed throughout tropical countries but indigenous to southern Asia and the Netherlands Indies, particularly Java, which is the leading center of commercial production. The fiber is too smooth and inelastic for successful spinning, but its resilience, lightness, and filling capacity especially adapt it for use as stuffing for mattresses, pillows, cushions, and certain sports equipment, and its low specific gravity makes it the preferred stuffing for life preservers. It is used as heat insulation in refrigerators, fireless cookers, and thermos flasks, and as sound insulation in automobiles, airplanes, and tanks. The last named is a recent war use, as is also its employment in sleeping bags, and in pontoon bridges. Competitive materials are cork, milkweed, and fiber glass.

Kapok is not grown in the United States. Over 90 percent of pre-war imports came from the Netherlands Indies; French Indochina and British India were minor sources. Ecuador is also a source but the type commonly imported from there is said to be inferior to Java kapok. Imports, in 1939, were close to the average, in both quantity and value, for the decade before the war. In 1941 imports reached the all-time record of 16,600 long tons, but declined sharply thereafter.

POST-WAR SHORT TERM

The loss of the Netherlands Indies early in the war cut off the chief source of kapok and necessitated strict channeling of available supply into war uses. There will most likely be a strong demand for kapok for the usual peacetime uses in the immediate post-war period. Imports may reach 15,000-25,000 long tons.

POST-WAR LONG TERM

The value of kapok will probably fluctuate with the general price level. Assuming per capita income at 1939 levels, it might be in the range of \$240-\$260 per long ton; assuming the higher level of income, it might reach \$300 per long ton.

Per capita income at 1939 level.

By reason of increase in population, kapok imports might be somewhat greater than in 1939, say, about 10,000 long tons, valued at about 2.5 million dollars (foreign value).

Per capita income 75 percent higher than in 1939.

Kapok imports might reach 15,000 long tons (60 percent above the 1939 level), valued at 4.5 million dollars (foreign value).

OTTER TRAWL NETS OF MANILA

Tariff paragraph: 1725.

Commodity: Nets or finished sections of nets for otter trawl fishing, wholly or in chief value of manila (abacs).

Rate of duty: Free.

GENERAL

Data on United States imports for 1939 are given below:

Quantity (1,000 pounds).....	987
Value (\$1,000).....	181
Unit value per pound.....	\$0.184

¹ Foreign value.

Manila otter trawl nets are used in fishing for species of fish which live on, or very near, the sea bottom. The nets are made by lacing together from 10 to 12 separate sections of netting to form a large, flat, conical-shaped bag. The otter trawl net has a wide mouth which, in use, is kept spread by two large boards (otter boards), one of which is attached to each side of the mouth of the net, and, as the boat moves forward, they are caused to flare apart by the pressure of the water.

In the decade ending with 1939, annual imports of manila otter trawl nets averaged 884,000 pounds, with a foreign value of \$178,000. In the pre-war period about three-fourths of the imports (by weight) came from the United Kingdom, and about one-fifth from Japan.

Domestic production of manila otter trawl nets is not separately reported, but is believed to be small. Domestic producers of cotton and flax nets have attempted to make machine-knotted manila otter trawl nets, but they could not compete successfully with the imported nets, most of which are hand-knotted. Because the supply of manila otter trawl nets has been curtailed, owing to wartime exigencies, some nets made of sisal and other hard fibers and some of cotton are being used. It is very likely, however, that the substitutes will be replaced by the more desirable manila product as soon as conditions permit.

POST-WAR SHORT TERM

Consumption of manila otter trawl nets is likely to be rather high because replacements for most of the nets now in service will be needed. Practically all of the nets are badly worn and have been kept in service only by numerous temporary repairs. Consumption might be 1.5-2.5 million pounds per year, nearly all of which would be imported.

POST-WAR LONG TERM

Consumption and Imports

Construction of a trawler suitable for handling large fishing gear requires a considerable outlay—in some instances as much as a quarter million dollars. Except for replacements, the addition of many new boats of this type to the fishing fleet during the long term is unlikely. Immediately before the war, however, some Pacific coast fishers, previously using other types of fishing gear, began to try out manila otter trawls. Any extensive shift to these trawls, such as might particularly occur at the higher income level, would, however, result in a somewhat larger consumption of the nets than in 1939.

Per capita income at 1939 level.

No material expansion is expected in the fishing industry supplied by trawlers using manila trawl nets. Consumption of manila otter trawl nets might be about the same as in 1939 when imports were approximately 1 million pounds. Assuming that the unit foreign value would be about 20 cents per pound (which was the average unit foreign value in the period 1935-39), the total foreign value of imports would be about \$200,000.

Per capita income 75 percent higher than in 1939.

If allowance is made for a somewhat wider use of manila otter trawl nets in the fishing industry, consumption might be in the neighborhood of 1.2 million pounds annually. At an average unit foreign value of 22 cents per pound, the total foreign value of imports would be about \$265,000.

SCHEDULE 11. WOOL AND MANUFACTURES

INTRODUCTION AND SUMMARY

This section covers all items in schedule 11 of which imports in 1939 exceeded \$100,000 (together with the item of wool tops, although imports of wool tops in that year were less than \$100,000).

The total number of the dutiable items covered in this section is 16. Imports of these items in 1939 were valued at 48.8 million dollars, out of a total value of 49.2 million dollars for all imports under this schedule. The section also includes duty-free wool (entered under bond for manufacture into carpets and related products), imports of which in 1939 were valued at 25.7 million dollars.

Articles dutiable under schedule 11 fall into two large groups: (1) Raw materials and (2) semimanufactures and finished manufactures. The raw materials include the natural fibers (wool, mohair, and several related kinds of hair), wool waste, noils, and rags. The value of the imports of these raw materials in 1939 was 29.9 million dollars as against 18.9 million, the value of imports of the more advanced dutiable products.

The following tabulation summarizes actual production and imports in 1939 of these two groups of dutiable articles, together with the figures for free carpet wool, and compares these statistics with estimates of post-war production and imports under the several assumptions with respect to national income and levels of duty:

Period; income level, and tariff treatment	Production for the domestic market		Imports	
	Value	Ratio to 1939	Foreign Value	Ratio to 1939
<i>Wool and wool manufactures, dutiable</i>				
Wool, noils, waste, and rags:	<i>Million dollars</i>	<i>Percent</i>	<i>Million dollars</i>	<i>Percent</i>
1939.....	188.7	100	29.9	100
Post-war long term:				
Per capita national income same as in 1939:				
Duty as in 1939.....	218.5	116	41.1	137
Duty reduced 50 percent.....	144.5	78	35.8	120
Duty increased 50 percent.....	243.5	131	28.5	79
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939.....	321.5	173	82.3	275
Duty reduced 50 percent.....	218.0	117	102.0	341
Duty increased 50 percent.....	264.5	139	60.0	167
Other dutiable items:				
1939.....	2,205.4	100	18.9	100
Post-war long term:				
Per capita national income same as in 1939:				
Duty as in 1939.....	2,430.3	110	25.3	130
Duty reduced 50 percent.....	2,131.4	97	122.1	647
Duty increased 50 percent.....	2,497.3	113	16.7	88
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939.....	3,582.2	160	60.0	318
Duty reduced 50 percent.....	3,117.5	141	211.7	1,123
Duty increased 50 percent.....	3,653.6	166	28.9	206
<i>Carpet wool, free</i>				
1939.....	0		25.7	100
Post-war long term:				
Per capita national income same as in 1939.....	0		25.0	97
Per capita national income 75 percent higher than in 1939.....	0		45.0	175

In 1939 the domestic production of dutiable wool (and related fibers), noils, waste, and rags was valued at 185.7 million dollars, and the foreign value of the imports totaled 29.9 million, equal to 16 percent of the domestic production. This percentage, of course, would be higher if the imports were valued on a basis comparable with domestic production. For the principal item of this group, raw wool and related hair, the 1939 ratio of imports to domestic production, in quantity, was 23 percent.¹ The sum of the 1939 figures of production of items dutiable under schedule 11, other than raw wool, noils, etc., is 2,205.4 million dollars, but this total involves extensive duplication of articles in different stages of manufacture. It is roughly estimated that without such duplication the value of the domestic production of this group in 1939 would have been 1,100 million to 1,150 million dollars. The foreign value of the imports was 18.9 million dollars, equal to about 1.8 percent of the adjusted figure for domestic production. If duties and importation expenses were added to the foreign value of the imports, this ratio would, of course, be higher. The only duty-free item associated with schedule 11 is carpet wool, of which there is no production in this country.

It is estimated that, with national income and duties as in 1939, the value of domestic production of dutiable wool (and related hair), noils, waste, and rags in the long-term post-war period would exceed the production in 1939 by somewhat more than the growth in population, and that imports would show a somewhat greater increase than production. The estimated increase in value of production is 10 percent, equal to the growth of population, whereas the estimated increase in imports of other dutiable items is larger. The estimated post-war imports of carpet wool are slightly less than the imports in 1939.

With national income 75 percent higher than in 1939, and with no change in duties, the value of the domestic production of dutiable wool (and related hair), noils, waste, and rags will probably exceed the production at the lower income level by about 50 percent, and the value of the imports will be more than twice as great, the disparity between these two ratios being found in the possible inability of the Far Western ranges to increase their production of sheep sufficiently to keep pace with the anticipated greater demand resulting from high income. The estimated effects of high national income on production and imports of other dutiable items are somewhat similar. A part (though less than half) of the excess in values at the high income level over those at the lower income level is due to probable advance in prices.

Estimates for the post-war period indicate that for the articles dutiable under this schedule, of both the groups distinguished, the effects of a 50-percent increase or a 50-percent decrease in duties upon the value both of domestic production and of imports would be more marked than for articles in most other tariff schedules.

A reduction or an increase of 50 percent in the duties on wool and hair, noils, waste, and rags might change considerably the ratio of imports to domestic production of these materials. Thus it is estimated that with national income as in 1939, a 50-percent reduction in the

¹ Special methods have had to be followed in estimating both the domestic production and the imports of wool and hair in 1939 itself, as a basis for the post-war estimates. The subject is fully covered in the section on dutiable wool.

duties on these materials would cause a considerable increase in the foreign value of imports. With respect to other items dutiable under schedule 11, the effects of changes in duty upon the ratio between imports and domestic production would be greater.

This tabulation further indicates that, if national income were 75 percent greater than in 1939 and rates of duty 50 percent lower than in 1939, the combined foreign value of the imports of all items dutiable under schedule 11 would probably be several times larger in the post-war period than in 1939. The combined value of domestic production under these conditions would also, however, be considerably greater than in 1939.

As pointed out in the general introduction, the summary estimates in the above table are subject to an appreciable margin of error. For the group of raw materials, the dominance of the one item of wool makes the margin of error in the group total practically the same as that for wool itself. The number of other articles dutiable under schedule 11 is sufficiently large to make probable such a measure of offsetting errors in the estimates for the individual items as to result in totals subject to only a moderate margin of error.

FREE WOOLS

Tariff paragraph: 1101 (b).

Commodity: Donskoi, Valparaiso, and other eo nomine wools, all other wools not finer than 40s, and hair of the camel, duty-free, under bond.

Rate of duty: Free.

NOTE.—These wools are duty-free, when bonded to be used in the manufacture of press cloth, camel's hair belting, knit or felt boots, heavy-furred lumbermen's socks, rugs, carpets, or any other floor coverings.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (clean weight, 1,000 pounds).....	102,714
Value (\$1,000).....	125,685
Unit value (per pound).....	\$0.25

¹ Foreign value.

There is no commercial production of carpet wools in the United States; hence the entire consumption is supplied by imports.¹ In 1939 about 105 million pounds of duty-free carpet wools of all descriptions were used in the United States in the production of approximately 62 million square yards of floor coverings. Practically 96 percent of the imports in 1939 (102.7 million pounds) consisted of the "unimproved" or true carpet wools, and 4 percent were other, or "improved" wools, not finer than 40s. The latter came chiefly from Argentina and New Zealand. The true carpet wools came principally from Argentina and British India; smaller quantities entered from many sources, chiefly the United Kingdom, Iraq, Syria, Egypt, Eire, and Portugal. China formerly was one of the principal suppliers, but has been comparatively unimportant since the Japanese took control of eastern China in 1937 and thereby closed the ports through which the exports had been moving.

¹ There is an output of about 0.5 percent of domestic wools not finer than 40s. The consumption of like wools for apparel uses is, however, several times larger than production, hence the domestic output is used for apparel purposes at prices which are raised by the duty to a level which makes them unavailable for use in carpet manufacture.

Consumption of carpet wool is very responsive to changes in consumer income. From an annual average of 78 million pounds (clean weight) during 1920-24, mill consumption increased to 99 million pounds during 1925-29, fell off to 62 million in 1930-34, and increased to 96 million in 1935-39. Since 1941 most of the carpet mill capacity has been diverted to the manufacture of cotton duck and wool blankets under wartime contracts. Some use was being made of rayon fiber by the carpet industry before the war, but it had scarcely advanced beyond the experimental stage and did not exceed 5 percent of the total fibers consumed. During the war, when imports of carpet wool and the manufacture of carpets have been sharply reduced, rayon has been more important, amounting in 1943 to 15 percent of the fiber consumed.

POST-WAR SHORT TERM

In this period the yardage of floor coverings manufactured is expected to average 110-115 million yards per year, or 75-85 percent larger than in 1939, in order to make up for an extremely short output during the war years. In the short-term post-war period with large supplies of suitable raw wools available in rapidly increasing volume, the use of rayon in floor coverings will probably decline. Consumption of raw wool, therefore, is expected to average about 155 million pounds per year, or nearly 50 percent larger than in 1939, with a value of 50 million dollars per year, compared with about 26 million dollars in 1939.

POST-WAR LONG TERM

Consumption and Imports

As indicated in the sections of this report on wool carpets and rugs,² it is believed that the various levels of duty to be considered in connection with Senate Report 341 may affect domestic production of wool carpets and rugs and, therefore, the imports of carpet wool, only to a relatively small extent. If the duties are 50 percent lower than in 1939, imports of carpet wool might be 3 percent less than with the 1939 duties. Similarly, if the duties on carpets and rugs were increased by 50 percent the imports of carpet wool might be 1 or 2 percent greater than with the 1939 duties.

Per capita income at 1939 level.

Allowing for a 10-percent increase in population, total consumption of floor coverings would be approximately 10 percent higher than in 1939. Owing to the probability of considerable use of rayon, it is likely, however, that imports of carpet wools will be somewhat less than in 1939 and will not exceed 100 million pounds, with a foreign value of about 25 million dollars.

Per capita income 75 percent higher than in 1939.

Under the higher income level, consumption of carpets, which in the past has always increased with high income, is estimated at about 50 percent above that in 1939. Taking into account the probable increase in the use of rayon, imports would probably total about 130 million pounds of the raw wools. At prices 30 percent higher than at the lower income level, these imports would have a total foreign value of approximately 45 million dollars.

² One of these reports covers machine-made wool carpets and rugs, par. 1117, and the other covers Oriental rugs, paragraph 1116 (a).

DUTIABLE WOOLS—RAW WOOL AND HAIR USED FOR APPAREL PURPOSES

Tariff paragraph	Commodity	Rate of duty (per pound of clean content)	Equivalent ad valorem (1939)
1101 (a)	Donskoi and like wools, camel hair, and other wools, not finer than 40s:		
	In the grease or washed	24¢	33% to 88%.
	Scoured	27¢	
	On the skin	22¢	
	Sorted or matchings (if not scoured)	25¢	
1102 (a)	Wools finer than 40s but not finer than 44s:		
	In the grease or washed	29¢	
	Scoured	32¢	
	On the skin	27¢	
	Sorted or matchings (if not scoured)	30¢	
1102 (b)	All other wools, mohair, and Angora rabbit hair:		
	In the grease or washed	34¢	
	Scoured	37¢	
	On the skin	32¢	
	Sorted or matchings (if not scoured)	35¢	
1102 (b)	Alpaca, llama, and vicuña, and Cashmere hair:		
	In the grease or washed	34¢	
	Scoured	37¢	
	On the skin	32¢	
	Sorted or matchings (if not scoured)	35¢	

NOTE.—The foregoing rates are those in effect on July 1, 1939. The ad valorem equivalents averaged about 33 percent on dutiable camel hair, 54 percent on alpaca, etc., 59 percent on mohair, and 88 percent on all dutiable wools, which constituted the greater part of the imports. The bulk of the imports are entered in the grease or washed, and the rates thereon (in terms of clean content) are considered the "basic" rates of duty. Effective November 15, 1941, in the trade agreement with Argentina, the rates on Donskoi and like wools, camel hair and other wools, not finer than 40s were lowered to 13, 16, 11, and 14 cents, respectively; and the rates on wools finer than 40s but not finer than 44s were lowered to 17, 20, 15, and 18 cents, respectively. Effective July 29, 1942, in the trade agreement with Peru the rates on alpaca, llama, and vicuña were lowered, and effective June 23, 1944, in the trade agreement with Iran, the rates on Cashmere hair were lowered, all to 13, 21, 16, and 19 cents, respectively.

GENERAL

Table 1 shows for 1939 United States production of wool and related hair, as reported by the United States Department of Agriculture, imports as reported by the United States Department of Commerce, and apparent consumption (production plus imports, less the insignificant exports).

TABLE 1.—Raw wool and hair: Reported production, imports, and apparent consumption in 1939

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (scoured equivalent) (1,000 pounds)	206,000	72	205,428	62,036	267,464	Percent
Value (\$1,000)	158,200	99	158,100	23,928		23
Unit value (per pound)	\$0.77	\$1.26	\$0.77	\$0.39		
Persons employed (number)	104,000					

1 Based on average Boston prices, clean scoured basis.
 2 Foreign value.
 3 Average clean value of wool, 37.5 cents, and of mohair and other hair, 62.9 cents, per pound.
 4 Estimated man-years.

Table 2 shows the Census statistics of "actual consumption" of wool and related hair in 1939, as reported by the manufacturers of woolen goods and related products. It distinguishes the consumption of domestic from that of imported material. Since the Census gives no values for the material consumed, such values have been computed by applying to the quantities the average unit prices shown in table 1, namely 77 cents per pound for domestic wool and mohair, and 39 cents per pound (foreign value) for the imported wool and related animal hair.

TABLE 2.—*Raw wool and hair: United States consumption in 1939, as reported by the Bureau of the Census*

Item	Domestic wool	Foreign wool	Total	Ratio of imported to total
Quantity (million pounds) ¹	274.0	61.0	335.0	Percent 18
Value (million dollars).....	211.0	22.8		
Unit value (per pound) ²	\$0.77	\$0.39		

¹ Estimated from data given by Bureau of the Census by applying to the reported total wool consumed the same distribution between domestic and foreign wool as that which occurred in the woolen and worsted industry. All mohair classed as domestic and all other hair as foreign.

² Based on average Boston prices, clean scoured basis.

³ Foreign values.

The significance of the wide differences between these two tabulations is discussed below.

This section covers apparel ¹ wool and related animal hair, principally mohair (Angora goat), camel hair, hair of the Cashmere goat, hair of three related South American animals (alpaca, llama, and vicuña), and hair of the Angora rabbit.

Wool accounted for about 92 percent and mohair for 8 percent of total United States production of wool and related hair in 1939. There is no domestic production of hair of the camel, Cashmere goat, alpaca, llama, or vicuña. There is a small production of Angora rabbit hair, but the quantity is not known. In 1939 wool accounted for 96 percent of the imports of these classes of fiber; imports of mohair were smaller than those of the other hairs as a group. Imports of wool and hair have varied widely over a period of years, depending on the degree of general business activity in this country, but the general tendency has been downward since 1923, in large part owing to an increase in the domestic production of wool and mohair, which rose from about 130 million pounds (scoured basis) in 1922 to 205.5 million pounds in 1939.

Characteristics of the sheep industry.

The sheep-raising industry differs materially in economic characteristics from the beef-cattle industry and the hog industry, in that it has two major joint products, wool and meat (mutton and lamb, hereafter, for brevity, referred to as lamb), together with minor byproducts. Although the ratio of the income from wool to that from lamb varies from year to year, during recent pre-war years wool and lamb have accounted for about 40 and 60 percent, respectively, of the total. Factors affecting the demand for lamb may thus materially affect the

¹ See section on carpet wool.

production of sheep, and consequently the output of wool; the converse is obviously true.

A reduction of 50 percent in the duties on wool would doubtless have a marked effect in increasing imports and reducing domestic production. An increase of 50 percent in the wool duties would have the opposite, though less marked effect. On the other hand, it is doubtful whether corresponding changes in the duties on live sheep and on lamb would have much effect on domestic production of sheep.

About two-thirds of the production of sheep is in the western range States, although large numbers are raised on farms in other States. The capacity of the western ranges to support the grazing of animals is limited. The sheep growers have to compete with the cattle growers for large sections of this range. Even if the duties on wool should be increased, it is doubtful whether the range country could expand its production of wool to fill the strong demand that would accompany a high national income. There might, however, be a relatively greater expansion in the production of sheep and wool on farms, although this is uncertain.

Disparities in wool statistics.

It is difficult to make estimates of the post-war domestic production and imports of wool and related hair because of the disparities between the series of statistics on which estimates must be based. Comparison of tables 1 and 2 shows that apparent consumption in 1939 was far below the reported actual consumption. This disparity is particularly conspicuous with respect to domestic wool (not including mohair); reported consumption exceeded reported production in 1939 by 52 million pounds, or 27 percent. For any single year a disparity of such magnitude might be explained by large withdrawals of wool from previously accumulated stocks. Such withdrawals, however, could not explain a continuing disparity over a period of years. Actual consumption exceeded apparent consumption of domestic wool in 4 out of the 5 years 1935-39; the excess averaged no less than 42 million pounds per year, a quantity much greater than that which could be explained by reduction in previously accumulated stocks.

The causes of the disparity between the two sets of statistics, or an appraisal of their relative accuracy are beyond the scope of this report. There is reason to believe that the Census statistics of consumption involve a certain amount of duplication and, therefore, overstate the actual consumption. It seems probable, on the other hand, that the statistics of production, which are necessarily largely based on estimates, materially understate the actual production.

It is possible to use either one of the two sets of data as a basis for post-war estimates regarding wool. The relation among the resultant figures, under the several assumptions regarding national income and rates of duty, would be roughly similar on the two bases, but the absolute figures for domestic production, under each of the assumptions, would be materially larger in the calculations based on table 2 than in those based on table 1.

It has seemed more appropriate, however, to base the post-war estimates mainly on pre-war data halfway between those of tables 1 and 2. Table 3 presents for 1939 such intermediate figures; the mean between production as shown in table 1 and consumption of domestic

wool as shown in table 2 is, in table 3, designated, for convenience, as domestic production. All the post-war estimates in this section are based on table 3.

TABLE 3.—*Raw wool and hair: Intermediate estimates of United States production, imports, and consumption, 1939*

Item	Domestic production	Imports	Total	Ratio of imports to total
Quantity (million pounds).....	290	62.0	352	Percent 20
Unit value (per pound).....	\$0.77	.30		
Value (million dollars).....	185	23.8		

Relation of wool consumption to domestic production and imports of wool manufactures.

The estimates of total consumption of wool and related hair in the post-war period, although starting with the pre-war consumption as estimated in table 3, are necessarily derived mainly from the results of the estimates regarding wool wastes and rags, wool semimanufactures and finished wool manufactures. Changes in national income affect materially the consumption of wool fabrics. Changes in rates of duty may affect materially the imports of semimanufactures and finished manufactures of wool, and these effects will be reflected in the domestic consumption of wool and related hair. If, for example, a 50-percent reduction in the duties on semimanufactures and finished manufactures should result in a substantial increase in imports of these products, this would obviously tend to reduce (though not necessarily proportionately) the consumption of raw wool in this country. The estimates for wool semimanufactures and finished manufactures take into account the possible effects of the competition of synthetic textile fibers on the demand for articles of wool, under different assumptions as to national income and rates of duty.

All post-war estimates regarding individual commodities in this series of reports are based on the assumption that changes in the rates of duty would apply to all commodities alike. It is obvious that, if the rates of duty on raw wool should be decreased or increased by 50 percent with no change in the rates of duty on wool semimanufactures and finished manufactures, the effects upon the consumption, and the domestic production, of raw wool would be considerably different from those hereafter forecast. In that case a reduction in the duty of raw wool would tend to increase the consumption of that commodity, so that the increase in imports would not be accompanied by an equal decrease in domestic production, although the share of imports in consumption would rise. An increase of 50 percent in the duty on raw wool, under these conditions, would have converse effects.

POST-WAR SHORT TERM

In this period the consumption of raw wool and hair will probably be appreciably larger than in 1939, in part because of higher incomes and in part because of deferred demand for wool fabrics left over from the war period, when civilian consumption has been restricted. United States production will probably be substantially smaller than in 1939, because of a liquidation of stock sheep which began in the fall of 1942.

Both production and imports in the immediate post-war years may be much affected by the policies pursued by the United States Government and the Government of Great Britain with reference both to the liquidation of the large Government-owned stocks and to the maintenance of prices to the growers. For this reason it is impracticable to forecast the volume of either domestic production or imports during this period.

POST-WAR LONG TERM

Consumption, Production, and Imports

All estimates of production and imports of wool in the long-term post-war period assume that the influence of the present large Government-owned stocks of wool, as well as the influence of wartime and immediate post-war policies of the United States Government and the British Government with respect to wool prices, will substantially cease to be felt during the post-war long-term period. As a matter of fact, this assumption may prove unfounded. It would, however, be impracticable to present significant estimates without making this assumption.

Per capita income at 1939 level.

Duties as in 1939.—On the basis of conclusions reached in the sections on woolsens and worsteds, yarns, tops, noils, wastes, and rags, total consumption of raw wool and related hair in the United States, on these assumptions regarding income and duties, is likely to be 3 to 9 percent larger than in 1939. On the basis of the pre-war figures in table 3, it would be 310-330 million pounds. It is difficult to forecast what part of this consumption would be supplied by domestic wool. There can be no certainty as to how long the process of liquidation of sheep, which began in 1942, will continue, or as to how rapid will be the upward trend, if any, at its close. Costs of production have risen sharply during the war, and many of the persons employed on sheep ranches have left them for the Army or for war industries. It is impossible to know to what extent these wartime conditions will have been readjusted by the long-term post-war period.

It should be borne in mind, however, that the general assumption in this report is that, if during that period the per capita income is the same as in 1939, the general price level of commodities (not, of course, that of every individual commodity) will be about the same as in 1939. This assumption involves the further assumption that, on the average for all commodities, costs of production will be about the same as in 1939. To what extent the cost of producing sheep may fail to conform to this general assumption is, of course, uncertain. Moreover, it is uncertain what changes in costs may have taken place in Australia and other wool exporting countries during the war, and how far these costs will have returned to pre-war levels in the post-war period. If costs in the domestic and foreign sheep-raising industries should be approximately adjusted to pre-war levels by the long-term period, the domestic production of wool and mohair might be somewhat greater than in 1939, although increasing pressure on the available range land makes it improbable that the expansion would equal that in the population. On the other hand, if costs fail to return to pre-war levels, domestic production of wool and mohair in the long-

term post-war period may be somewhat less than in 1939. Under these assumptions regarding income and duties, production might range from as low as 217 million pounds to as high as 264 million pounds. Conversely, the imports of wool and related hair might range from 62-99 million pounds.

It seems probable that the average price of domestic wool and mohair, and the foreign unit value of imported wool and related hair, will be approximately the same, under these assumptions regarding income and duties, as in 1939, namely 77 cents and 39 cents per pound, respectively. The value of the domestic wool and mohair produced might be within the range of 167-203 million dollars, and the foreign value of imports of wool and hair might be 24-39 million dollars.

Duties reduced by 50 percent.—It is estimated that such a lowering of the duties on both wool and its derivative products would result in reducing the consumption of wool in the United States to 270-290 million pounds (more than 10 percent less than with unchanged duties). The reduction in the wool duties would tend to lessen materially the production of wool and mohair; production might be from one-fourth to one-third less than with duties as in 1939, or 148-203 million pounds. Conversely, imports might be 81-130 million pounds.

The price of domestic wool would doubtless fall with such a reduction in the duty, say, by about 10 percent; the foreign price of imported wool might rise somewhat, perhaps by as much as 10 percent. If the domestic price should thus become 70 cents per pound and the foreign unit value 43 cents per pound, the value of domestic wool and mohair produced would be 104-142 million dollars, and the foreign value of the imports of wool and related hair would be 35-56 million dollars.

Duties increased by 50 percent.—It is estimated (on the basis of other sections in this report) that total consumption of wool and other related hair under this duty assumption would be 270-290 million pounds (practically the same as with a 50-percent reduction in duties). The increase in duties would presumably raise somewhat the price of domestic wool and stimulate production. Because of the limited capacity of the range lands, however, the effect in increasing production of wool would probably be less marked than the effect of a lowering of the price in decreasing the production. Domestic production of wool and mohair might be 229-261 million pounds. Imports would consequently be somewhere in the range of 27-43 million pounds.

The price of the domestic wool might be about 10 percent higher than with no change in duties, and the foreign unit value of imports perhaps 10 percent lower than at the 1939 duty level, amounting, respectively, to about 85 cents and 35 cents per pound. The total value of the output of domestic wool and mohair, on these assumptions, would be 195-222 million dollars, and the foreign value of the imports 9-15 million dollars.

Per capita income 75 percent higher than in 1939.

An increase of 75 percent in per capita income in the United States would result in materially larger consumption of wool fabrics, and of raw wool and related hair, than with income at the 1939 level. It is uncertain whether wool production in the United States would increase in equal measure. Consequently, the share of imports in the consumption might be somewhat higher, under each of the assumptions as to duty, than with income as in 1939.

Summary of estimates.

Post-war estimates of consumption of all wool and related hair, production of domestic wool and mohair, and imports of wool and related hair are summarized and compared with 1939 data in tables 4, 5, and 6. Table 4 is based on the 1939 data contained in table 1; table 5 is based on the 1939 data contained in table 2; and table 6 is based on the intermediate data in table 3, which have been the basis for the discussion in this section.

TABLE 4.—*Raw wool and related hair: United States production, imports, and apparent consumption in 1939, and post-war estimates under the assumptions of Senate Resolution 341*

[Based on pre-war data as in table 1]

Period, income level, and tariff treatment	Production				Imports				Consumption, total
	Quantity	Unit value	Value	Ratio to total consumption	Quantity	Unit value (foreign)	Value (foreign)	Ratio to total consumption	
	Million pounds	Per pound	Million dollars	Percent	Million pounds	Per pound	Million dollars	Percent	Million pounds
1939.....	305	\$0.77	188	77	62	\$0.29	21	23	367
Post-war long term:									
Per capita income as in 1939:									
Duty as in 1939.....	192-256	.77	158-183	70-80	54-88	.29	21-34	20-30	275-267
Duty reduced by 50 percent.....	129-178	.70	90-125	55-70	70-115	.43	30-49	30-45	296-265
Duty increased by 50 percent.....	204-234	.85	173-199	85-90	24-39	.25	8-14	10-15	240-269
Per capita income 75 per cent higher than in 1939:									
Duty as in 1939.....	212-291	1.00	212-291	69-75	39-120	.51	55-95	25-40	306-376
Duty reduced by 50 percent.....	159-208	.92	159-191	50-65	105-169	.85	69-99	25-39	339-329
Duty increased by 50 percent.....	236-255	1.08	255-308	75-85	57-84	.45	22-39	15-25	315-339

TABLE 5.—*Raw wool and related hair: Consumption of domestic and imported products in 1939, and post-war estimates under the assumptions of Senate Resolution 341*

[Based on pre-war data as in table 2]

Period, income level, and tariff treatment	Consumption of domestic products				Consumption of imported products				Consumption, total
	Quantity	Unit value	Value	Ratio to total consumption	Quantity	Unit value (foreign)	Value (foreign)	Ratio to total consumption	
	Million pounds	Per pound	Million dollars	Percent	Million pounds	Per pound	Million dollars	Percent	Million pounds
1939.....	1 274	\$0.77	197.9	81.8	61	\$0.29	22.8	18.2	336
Post-war long term:									
Per capita income as in 1939:									
Duty as in 1939.....	240-290	.77	185-225	70-80	70-110	.29	25-45	20-30	345-336
Duty reduced by 50 per cent.....	165-225	.70	115-155	55-70	90-145	.43	40-60	20-45	300-320
Duty increased by 50 percent.....	255-290	.85	215-245	85-90	20-30	.25	11-17	10-15	300-320
Per capita income 75 per cent higher than in 1939:									
Duty as in 1939.....	270-330	1.00	265-330	69-75	110-135	.51	55-95	25-40	445-336
Duty reduced by 50 percent.....	190-230	.92	175-240	50-65	125-209	.85	75-119	25-39	350-329
Duty increased by 50 percent.....	295-345	1.08	320-396	75-85	69-105	.45	25-39	15-25	300-336

¹ Estimated by applying to total wool consumed the same distribution between domestic and foreign wool as that which occurred in the woolen and worsted industry. All mohair classed as domestic and all "other" hair classed as foreign.

TABLE 6.—Raw wool and related hair: Estimated United States production, imports, and consumption in 1939, and post-war estimates under the assumptions of Senate Resolution 341

(Based on pre-war data as in table 3)

Period, income level, and tariff treatment	Production				Imports				Consumption, total
	Quantity	Unit value	Value	Ratio to total consumption	Quantity	Unit value (foreign)	Value (foreign)	Ratio to total consumption	
	Million pounds	Per pound	Million dollars	Percent	Million pounds	Per pound	Million dollars	Percent	Million pounds
1939	240	\$8.77	185	79	62	\$8.38	26	21	302
Post-war long term:									
Per capita income as in 1939:									
Duty as in 1939	217-264	.77	167-208	70-80	62-99	.35	24-39	20-30	219-320
Duty reduced by 50 percent	148-208	.70	104-142	55-70	81-120	.42	25-56	20-45	270-289
Duty increased by 50 percent	229-261	.85	196-222	85-90	37-42	.35	9-15	10-15	270-289
Per capita income 75 percent higher than in 1939:									
Duty as in 1939	240-315	1.00	240-315	68-75	100-168	.51	51-88	28-46	400-420
Duty reduced by 50 percent	170-224	.92	156-215	50-65	119-180	.86	67-101	25-39	340-390
Duty increased by 50 percent	266-319	1.08	287-344	75-85	83-94	.46	24-42	15-25	355-375

Exports

Domestic exports of raw wool and hair will probably be extremely small in the post-war period.

Employment

At 6.2 hours per head, 31.4 million man-days of 10 hours, or 105,000 man-years of 300 working days, were required to care for about 50.5 million stock sheep and Angora goats in 1939. In the post-war long term, with a domestic production of 70-110 percent of 1939, or 22.0-34.5 million 10-hour man-days or 73,000-115,000 man-years of 300 working days would be required, depending on the assumed level of national income and rates of duty.

WOOL WASTES

Tariff par.: 1105.

Commodity: Noils and other wool mill wastes. (Rags, mungo, shoddy, and wool extract, also dutiable under par. 1105, are discussed in a separate report.)

Rate of duty: 5¢ to 34¢ per lb.

Equivalent ad valorem (1939): 42%.

Note.—The various rates fixed in the Tariff Act of 1930 on the commodities covered by this report ranged from 5 to 37 cents per pound. All rates were reduced, effective January 1, 1939, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Appar-ent con-sump-tion ¹	Ratio of imports to con-sump-tion
	Total	For ex-port	For do-mestic market			
Quantity (1,000 pounds).....	46,346	294	47,442	9,923	57,385	Percent 17.3
Value (\$1,000).....	\$ 14,504	225	14,779	\$ 2,082		
Unit value (per pound).....	\$0.30	\$0.26	\$0.30	\$0.37		

¹ Total consumption (as reported by Bureau of the Census) for Woolen and Worsted, Knit Goods, Wool-felt Hats, Cotton, and Felt Goods industries. Apparent production data derived by subtracting imports and adding exports.

² Estimated.

³ Foreign value.

Waste is unavoidably made at each process in the sequence of wool manufacturing. Most of the waste made on woolen or worsted machinery is subsequently remanufactured on woolen machinery. The most important of these wastes is wool noils, consisting of the shorter fibers discarded by the comb in making wool top from the longer fibers. Total consumption, as shown in census reports, of noils and other wool mill wastes in 1939 was 57,385,000 pounds; this quantity is exclusive of unrecorded quantities remanufactured in the mills where made.

United States imports of wool wastes are relatively small, and consist chiefly of wool noils of fine grades, which find their main use in the wool-felt hat industry (see table).

Wool wastes: Rates of duty in the Tariff Act of 1930 and in trade agreement with the United Kingdom, and imports in 1939, by tariff classes

Tariff class	Rate of duty			Imports, 1939		
	Tariff Act of 1930	United Kingdom trade agreement	Equi-valent ad valorem, 1939	Quan-tity	Value ¹	Unit value
	Per pound	Per pound	Percent	1,000 pounds	1,000 dollars	Per pound
Top, stubbing, roving, and ring waste.....	\$0.37	\$0.34	68	29	10	\$0.59
Garnetted waste.....	.26	.19	37	143	69	.48
Noils, carbonized.....	.30	.21	48	975	472	.48
Noils, not carbonized.....	.22	.16	42	5,067	1,941	.38
Thread or yarn waste.....	.25	.15	45	2,784	937	.37
Card or burr waste, carbonized.....	.22	.15	47	126	52	.38
Card or burr waste, not carbonized.....	.16	.14	54	299	77	.26
Wool wastes, n. s. p. l.....	.24	.14	42	12	4	.33
Flocks.....	.68	.68	21	812	129	.22
Total.....			42	9,923	2,082	.37

¹ Foreign value.

Under the Tariff Act of 1930 the duties on wastes were proportionate to the duty on raw wool substantially in accordance with their relative values. In the trade agreement with the United Kingdom, effective January 1, 1939, the duties on noils and other wastes were reduced without a corresponding reduction being made in the duty on raw wool.

Both consumption and production of wool noils and mill wastes are related to activity in the woolen and worsted industry. Consumption is related directly to the production of woolen yarn, and production to the production of worsted yarn and of the wool top from which it is manufactured. Changes in the rates of duty on raw wool, wool yarns, and wool fabrics, by affecting the consumption of raw wool, will affect the production of wool waste.¹

POST-WAR SHORT TERM

Because of the high degree of activity which will probably prevail in the worsted industry in the United States, production and consumption of noils and wastes will probably be considerably greater than in 1939. It is likely that imports also will increase, although this will depend to some extent on the state of foreign production and requirements in this period.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—With the woolen and worsted industry and its branches expected to be operating at approximately a 10 percent higher level than in 1939 because of the increase in population, the production and consumption of wool mill wastes would also be at a proportionately higher level. Production for the domestic market might be 50–55 million pounds, valued at 15–17 million dollars, and consumption 60–70 million pounds a year. Imports would probably furnish about the same proportion of consumption as in 1939, namely 17 percent, and be around 10–14 million pounds. The unit value of imports, which was abnormally low in 1939, might be expected to rise to about the 1930–38 average (44 cents a pound). Total imports would then have a foreign value of 4½–6 million dollars a year.

Duty reduced by 50 percent.—Because of the somewhat smaller output of wool top and yarn as the result of larger imports of these materials and of wool fabric, the production of wool mill wastes might be 10–25 percent less than if the duty were not changed. Total production for the domestic market would then be 35–45 million pounds a year. The average value may be about 10 percent less than with the duties the same as in 1939, in which case domestic production would be valued at 9–12 million dollars a year. Consumption would also be reduced but not to the same extent, as it would hardly be affected by imports of top and yarn. It might decline, below that estimated with the duty the same as in 1939, to about the same degree as production of fabrics, or 5–8 percent. It would then be 55–65 million pounds a year, of which 15–25 million pounds (about one-third) might be

¹ See separate sections on raw wool, wool yarns, wool fabrics, and wool tops.

supplied by imports. At the lower duties the average quality of imports probably would be reduced, and as a result, the average value might be 10 percent less than with no change in duties, or about 40 cents a pound. The total foreign value of imports would then be 6-10 million dollars a year.

Duty increased by 50 percent.—Because of the effect of higher duties on wool and wool fabric in raising prices and thus lessening the sale of wool fabrics, the production of wool mill wastes for the domestic market might be about 10 percent less than with no change in duties. It would then be 45-50 million pounds a year, valued at 15-17 million dollars. Consumption might remain the same as with no change in duties, or 60-70 million pounds a year, as the effect of reduced fabric production presumably would be offset by the tendency to shift to the use of cheaper materials (among which noils and other wastes are included) to avoid the full consequence of the increase in the price of raw wool. The quantity imported might be 30-60 percent greater than with duties unchanged, and amount to 15-20 million pounds a year, or about 25 percent of consumption. The unit value, possibly would be slightly greater than at the unchanged rate of duty, with the result that the total foreign value of imports would be 7-10 million dollars.

Per capita income 75 percent higher than in 1939.

Because of increased activity in the woolen and worsted industry, the production of wool mill wastes might be about 20 percent greater than with per capita income the same as in 1939. Consumption would probably not increase to the same extent as there would be a tendency to use a smaller proportion of wool mill wastes and a greater proportion of raw wool. The quantity of imports might remain about the same as at the lower level of income, although the average foreign value possibly would increase about 30 percent, as the result of higher prices and a higher average quality of imports. On the basis of these considerations, the following estimates are derived from those made on the basis of per capita income being the same as in 1939.

Duty as in 1939.—Consumption of wool mill wastes possibly would be 70-80 million pounds a year, of which production might be 60-65 million pounds, valued at 24-26 million dollars and imports 10-15 million pounds (15-20 percent of consumption), with a foreign value of 6-9 million dollars.

Duty reduced by 50 percent.—Annual consumption might be 65-75 million pounds, of which production possibly would supply 45-55 million, valued at 16-20 million dollars, and imports 15-25 million (25-30 percent of consumption), with a foreign value of 9-12 million dollars a year.

Duty increased by 50 percent.—Consumption might be 70-80 million pounds a year of which production possibly would supply 55-60 million pounds valued at 24-26 million dollars and imports 15-20 million pounds (20-25 percent of consumption), with a foreign value of 10-14 million dollars a year.

Exports

Exports of wool mill wastes have been widely distributed, going to Canada, the United Kingdom, and various European and Latin American markets. They have been small in comparison with production

and imports. In the period 1937-39 they ranged from 600,000 to 1,300,000 pounds, valued at \$75,000 to \$225,000 a year. They may be approximately the same after the war, unless the duties are increased, in which case the demand for noils and other wool mill wastes in the United States might cause exports virtually to cease.

Employment

Data are not available.

WOOL RAGS AND SHODDY

Tariff paragraph: 1105.

Commodity: Wool rags, shoddy, mungo, and wool extract.
(For wool noils and mill waste, also dutiable under par. 1105, see separate report.)

Rate of duty: 9¢ to 14¢ per lb.

Equivalent ad valorem (1939): 33%.

NOTE.—The Tariff Act of 1930 fixed rates on these products ranging from 10 to 24 cents per pound. The rates were reduced pursuant to the trade agreement with the United Kingdom, effective January 1, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption ²	Ratio of imports to consumption
	Total ¹	For export	For domestic market ¹			
Quantity (1,000 pounds).....	99,709	9,119	90,590	8,421	99,011	Percent 8.5
Value (\$1,000).....	\$13,959	719	13,240	2,323		
Unit value (per pound).....	\$0.14	\$0.08	\$0.15	\$0.28		

¹ Computed from statistics of consumption, exports, and imports; the third column represents consumption of domestic rags.

² As reported by Bureau of the Census for Woolen and Worsted, Knit Goods, Felt Goods, and Cotton Manufacturing Industries.

³ Estimated.

⁴ Foreign value.

Wool rags and reclaimed wool fiber: Rates of duty in Tariff Act of 1930 and in the trade agreement with the United Kingdom and imports in 1939, by tariff classes

Tariff class	Rates of duty			Imports 1939		
	Tariff Act of 1930	United Kingdom trade agreement	Equivalent ad valorem 1939	Quantity	Value ¹	Unit value ¹
	<i>Per pound</i>	<i>Per pound</i>	<i>Percent</i>	<i>1,000 pounds</i>	<i>1,000 dollars</i>	<i>Per pound</i>
Wool rags.....	\$0.13	\$0.09	33	8,418	2,323	\$0.28
Shoddy and wool extract.....	.24	.14	41	3	1	.33
Mungo.....	.10	.09		none		
Total.....			33	8,421	2,323	.28

¹ Foreign value.

Wool rags vary widely in quality and price, depending on the type and color of the original fabric, and the grade of wool used. Old wool rags are obtained from used clothing, such as suits, dresses, sweaters, and stockings. New wool rags include clippings from the cutting tables of garment manufacturers, and headings or short lengths cut from the ends of new pieces at the textile mills. Under the provisions of the Wool Products Labeling Act, effective July 15, 1941, fibers obtained from old wool rags are termed "reused wool," whereas fibers obtained from new wool rags are termed "reprocessed wool." All rags have to be reduced to a fibrous state, known as shoddy, before they are usable for remanufacture in woolen mills.

Shoddy, as the term is generally used in this country, means any wool fiber reclaimed from wool rags; but, as used in the tariff act, it applies only to wool fiber recovered from soft woolen goods, such as knit underwear, stockings, sweaters, soft flannels, and dress goods. Mungo is wool fiber recovered from rags of goods which have been heavily fullered or felted, or made of hard-spun yards, and is inferior in quality to shoddy. Wool extract is wool fiber extracted by carbonization from wool rags containing a mixture of cotton or other vegetable fiber.

Shoddy is an important raw material in the manufacture of medium- and low-priced woolen goods such as overcoatings and suitings. It is seldom used alone, but is ordinarily blended with new wool or wool mill wastes. Shoddy and wool mill wastes partly supplement and partly compete with new wool. Because of their lower value they allow the use of wool fiber in garments and other products selling in a lower priced field than new wool, and to this extent compete with cotton, rayon staple fiber, and other relatively cheap fibers. In normal times shoddy and wool mill wastes furnish approximately half the raw material used by the United States woolen industry. They are not used in the worsted industry.

Rags are collected by dealers who sort and grade them and in turn sell them to shoddy manufacturers or directly to woolen mills. If demand and price are strong, collection is large and many rags reach the mills; if the price is down, low-grade rags are not collected and consequently consumption is less. So, in a literal sense rags are not produced, they accumulate. They are either collected, or not collected, demand and price being the factors determining the quantity collected.

Wool rags are a more important item in international commerce than shoddy, mungo, or wool extract. Imports are principally rags from knit goods and fine flannels, which are not available in large quantities in the United States.

The United Kingdom is the principal supplier of wool rags imported into the United States. The total quantity of imports was in the neighborhood of 20 million pounds a year in 1925-29, but under the Tariff Act of 1930, in which the statutory rate was increased from 7½ to 18 cents a pound, the average quantity (through 1938) was only about 2 million pounds annually. Imports increased to 8.4 million pounds in 1939, following reduction of the duty on rags to 9 cents a pound on January 1 of that year.

In the latest pre-war years, the exports of rags from the United States exceeded imports in quantity, although not in value. The unit

value of exports in 1939 was less than one-third the unit value (foreign) of imports in that year. The principal foreign markets were the United Kingdom, Japan, and Italy.

POST-WAR SHORT TERM

Because of the expected high level of activity in the wool manufacturing industry, the quantity of rags available from domestic sources and the total quantity consumed in the United States probably will be greater than in 1939. Imports may be about the same as in that year, although this will depend to a great extent on supply conditions abroad.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—As the result of population increase, consumption might be about 10 percent greater than in 1939 or in the neighborhood of 110 million pounds a year. The quantity of rags obtained in this country (excluding those exported), i. e. "production" for the domestic market, possibly would be about 95–100 million pounds, and assuming an average value about the same as in 1939, would be valued at 14–15 million dollars a year. Imports might be about 10–15 million pounds, or supply 9–14 percent of consumption. The average value of imports in 1939 (28 cents a pound) was lower than in most recent pre-war years. An average value of 35 cents a pound (corresponding with that for the years 1935–38) is therefore assumed. Upon this basis, the total value of imports would be about 3.5–5.2 million dollars a year.

Duty reduced by 50 percent.—As the 50-percent reduction in duty on rags would be accompanied by a corresponding reduction in duties on raw wool and wool manufactures, the consumption of rags might decline because of a decline in the domestic production of woollen yarn in which shoddy is used and because of the tendency to use virgin wool as a result of the reduced price of raw wool. The consumption of rags might therefore be about 10 percent less than if there were no change in the duty, in which case the consumption would be about 100 million pounds a year. Because of lower prices the quantity of rags obtained in the United States for domestic consumption might be reduced to about 80–85 million pounds; the value might be from 10–12 million dollars. The reduced duty would operate to stimulate imports which might supply as much as 15–20 million pounds a year, or 50–100 percent greater than with no change in duty and amount to 15–20 percent of consumption. The average quality, and consequently the unit value, of imports would probably be somewhat lower than if the duty were unchanged. A unit value of 30 cents a pound is assumed, in which case the foreign value of imports would be 4½–6 million dollars a year.

Duty increased by 50 percent.—The increased cost of raw wool, as the result of a higher duty on that material, would tend to increase the consumption of substitute fibers, of which wool rags is an important source. Consumption might be about 10 percent greater than if duties were unchanged, and amount to approximately 120 million pounds a year. In the presence of an active demand in the United

States, the quantity of rags obtained in this country for domestic consumption might be about 112 million pounds a year, with a value of 18-20 million dollars. Imports might be fairly well maintained in spite of the increased duty, and amount to about 8 million pounds a year, or 7 percent of consumption. The average quality of imports probably would be better, and the unit value higher than if the duty were unchanged. A unit value of 37 cents a pound is assumed, in which case the total value of imports would be 3 million dollars a year.

Per capita income 75 percent higher than in 1939.

The increased consumption of wool fabrics probably would cause an increase in the supply and consumption of wool rags, although they might constitute a smaller proportion of the total raw materials used. Compared with an increase of 20 to 35 percent in wool fabric consumption, the consumption of wool rags might be about 10 percent greater than if per capita income were unchanged. The increase in the domestic supply would possibly be less than 10 percent, and that in imports greater than 10 percent because of the tendency to utilize a larger proportion of the more costly rags obtained from abroad. The effect of changes in the duty on imports possibly would not be so pronounced as at the lower level of income. The price of rags, both in the United States and abroad, probably would be higher than with per capita income the same as in 1939, because of the increase (30 percent) which is assumed in the price of raw wool. An increase of 20 percent in both the foreign unit value and the domestic unit value is assumed. On the basis of the foregoing considerations, the following estimates are derived from those which have already been made, under the three rates of duty, with per capita income the same as in 1939.

Duty as in 1939.—Consumption possibly would be about 120 million pounds a year. The quantity obtained from domestic sources (excluding that exported) might be in the neighborhood of 105 million pounds, with a value of 19 million dollars. Imports might be 15 million pounds, or 12.5 percent of consumption, with a foreign value of 6.3 million dollars a year.

Duty reduced by 50 percent.—Consumption might be about 110 million pounds a year. The domestic supply (excluding exports) possibly would be 90 million pounds, with a value of 14-15 million dollars, and imports be 20 million pounds, or 18 percent of consumption, with a foreign value of 7.5 million dollars a year.

Duty increased by 50 percent.—Consumption possibly would be 130 million pounds a year. The domestic supply (excluding exports) might be about 120 million pounds a year with a value of 24 million dollars, and imports be 10 million pounds, or 8 percent of consumption, with a foreign value of 4.5 million dollars a year.

Exports

With duties the same as in 1939, exports probably would be somewhat greater than in that year, say 9-12 million pounds, valued at 0.7-1.0 million dollars, depending on business conditions in the United States and abroad. If duties were reduced 50 percent, the lower prices in the United States might cause exports to double in

quantity, and to increase 50-70 percent in value. If duties were increased 50 percent, exports might be only about one-half as great in quantity, and only two-thirds as great in value as if the duties were unchanged.

Employment

Data are not available.

WOOL TOP

Tariff paragraph: 1106.

Commodity: Wool top, including top of mohair, camel hair, and like fibers.

Rate of duty: 37¢ per lb. + 12½% ad val. *Equivalent ad valorem (1939): 62%.*

Note.—The rate fixed in the Tariff Act of 1930 was 37 cents per pound plus 20 percent ad valorem. The specific duty of 37 cents per pound is intended as compensatory for the duty on raw wool. A change in this part of the duty, accompanied by a corresponding change in the raw wool duty, presumably would not alter the margin of protection afforded domestic manufacturers. The ad valorem portion of the rate was reduced to 12½ percent pursuant to the trade agreement with the United Kingdom, effective January 1, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For domestic market ¹			
Quantity (1,000 pounds).....	198,808	198,808	114	198,922	Percent 0.06
Value (\$1,000).....	\$ 172,963	\$ 172,963	\$ 86		
Unit value (per pound).....	\$0.87	\$0.87	\$0.75		
Persons employed (number).....	(²)				

¹ Exports were negligible.

² Estimated.

³ Foreign value.

⁴ Not available; persons reported in the production of woolen and worsted cloth include those engaged in making top.

Wool top is a continuous and comparatively thick strand or rope of wool, produced by combing out the shorter fibers (noils) and paralleling the longer remaining fibers. It is an intermediate product in making worsted yarn for use by the knitting and weaving industries. It is obtained in recognized grades, is easily transported, and enters extensively into commerce.

Approximately 75 percent of the top-making machinery in this country is located in integrated mills and official data covering value of production of tops in such mills are not available. In 1939 only 3 percent of the total top produced was made for sale, about 44 percent was combed on commission partly by separate top-making mills and partly by integrated mills, and the remaining 53 percent was made for own use. In the foreign countries from which most imports are received, 70 to 80 percent of the top is made for sale or on commission, in highly specialized top-making mills.

Imports during the decade 1930-39 were a very small fraction of 1 percent of consumption. They were not comparable with the bulk of domestic production and were confined to top of a high grade and value, or of a fiber not ordinarily produced in this country, such as camel hair, vicuña, and alpaca. The United Kingdom, France,

and Belgium customarily have been our principal suppliers. In 1940 and 1941 when importation from these sources was either difficult or impossible, most of the imports were received from Japan.

In the United States about 85 percent of the value of wool top represents the cost of raw wool and only about 15 percent represents value added by manufacture. Quoted market prices for selected grades give an indication of the relation between domestic and foreign prices. For the 6 years 1933-38 the average price, in Boston, of 64s top combed from domestic wool was \$1.02 a pound. During the same period, the average price in Boston of 64s top combed in this country from foreign wool was \$1.10 a pound, as compared with 61 cents in Bradford, England, for the identical grade manufactured there. The difference between the two prices, 49 cents a pound, was approximately the same as the United States duty on this grade. In 1939, as the result of a decline in the foreign price, the difference increased to 52 cents. The greater spread, though accompanied by a reduction in the United States duty effective January 1, 1939, did not result in much change in the volume of imports, chiefly because of abnormal conditions in the wool market associated with the preparation for war in Europe. An additional reason is a lag that occurs (especially because of futures buying) in the response of the market to changes in price relationships.

Between 1939 and 1942 the production of wool top in the United States increased about 70 percent, and it has since been maintained at a high level. The increase occurred almost entirely from the greater utilization of existing machinery, largely as the result of government orders. Imports of tops have likewise increased.

The consumption of wool top depends on the production of worsted yarn, and, ultimately, on the production of worsted fabrics and knit goods. The following estimates of consumption, under the different assumptions regarding the levels of national income and of duties, are therefore based on the estimates made elsewhere regarding the production of the finished products into which wool top is manufactured.¹

POST-WAR SHORT TERM

With a sizable backlog of demand for worsted clothing added to the need to reoutfit soldiers returning to civilian life, it seems not unreasonable to expect operation of top-making machinery at capacity for the first few years following the war. Imports will probably be comparatively small, owing to both the accumulated needs abroad and the delay that will attend the restoration of full production.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—With an estimated per capita production of yarn and fabrics at about the 1939 rate, it follows that consumption of top would also be at about the same level. Total domestic production (with an allowance of 10 percent for population increase) then would be about 210-230 million pounds a year, and assuming a unit value

¹ See statistics on wools and worsteds (part. 1285 and 1160 (a)), and wool yarn (part. 1107).

the same as in 1939, would be valued at 183-200 million dollars. Although imports would still be a very small proportion of the total supply they would probably be considerably greater than in 1939, because of removal of the conditions abroad which had prevented imports from responding to the reduction of the duty which took place at the beginning of that year. They might total 200,000-300,000 pounds a year. As the average foreign value of imports in 1939 (75 cents a pound) was comparatively low, it is assumed that unit prices will average about one-third higher. Upon this basis, the total foreign value would be \$200,000-\$300,000 a year.

Duty reduced by 50 percent.—The reduction in duties (especially on raw wool) would operate to reduce the price and increase the consumption of worsteds and wool knit-goods. The greater imports both of these articles and of yarn, however, would reduce the consumption of tops, possibly by as much as 15-20 percent, or to 170-195 million pounds a year. Of the reduced quantity, imports would supply a much larger proportion than with duty as in 1939.

The reduction in the ad valorem portion of the rate from 12½ to 6½ percent, on the basis of imports in 1939, would be equivalent to a reduction of about 4½ cents a pound, which would be a major factor in comparison with the cost of processing; the prevailing charge for custom combing in England before the war was only about 7 cents per pound. The reduction would probably be sufficient, therefore, to cause a very material increase in imports. The quantity imported might be 5-15 percent of consumption in the United States, or 10-25 million pounds a year. Imports would no longer be confined to specialties, and for this reason the average foreign value per pound probably would be less than if the duty were not changed. It might be 70 cents a pound, in which case the total foreign value of imports would be 7-17.5 million dollars a year.

Domestic production probably would be considerably less than if the duty were not changed. It might be 145-185 million pounds a year, or roughly 70-90 percent of the quantity combed in 1939. Assuming a unit value about 10 percent less than with the duty unchanged the total value of domestic production would be 116-148 million dollars.

Duty increased by 50 percent.—The higher prices in the United States probably would reduce the per capita consumption of wool fabrics and knit goods so that the total consumption of wool top might be only 190-210 million pounds or about the same as in 1939, in spite of the larger population. Almost the entire amount would probably be supplied by production in the United States and have a value of 180-200 million dollars. Imports would be subject to about the same ad valorem rate of duty as that actually in effect from 1930-38; and the annual imports would possibly be about the same as during that period, or 100,000-150,000 pounds, valued at \$115,000-\$172,000 foreign value.

Per capita income 75 percent higher than in 1939.

Consumption of wool goods might be 20-35 percent greater than that estimated on the basis of the 1939 level of income; and the consumption of top under each of the different tariff levels would undergo a similar increase. The average value of production might be about 30 percent greater and the average foreign value of imports 20-30

percent greater than was estimated with per capita income the same as in 1939.

The following estimates are substantially parallel to those previously made for consumption, production, and imports, under each of the three assumed levels of duty, at the lower level of income.

Duty as in 1939.—Consumption of wool tops might be 250-280 million pounds a year. Of this amount, over 99 percent would be supplied by production in the United States valued at 280-314 million dollars. Imports might be 300,000-400,000 pounds with a foreign value of \$360,000-\$480,000 a year.

Duty reduced by 50 percent.—Consumption might be reduced to 200-230 million pounds a year, because of larger imports of wool yarn and fabrics. Domestic production of top possibly would be 175-220 million pounds valued at 180-227 million dollars, and imports 10-25 million pounds with a foreign value of 9-22½ million dollars a year.

Duty increased by 50 percent.—Because of higher prices that would result from increased duties (including those on raw wool) the consumption of top would be less than if the duty were not changed. It might be 230-260 million pounds of which all but a very small amount would be supplied by production in the United States. Domestic production might have a value of 281-317 million dollars a year. Imports possibly would be 150,000-225,000 pounds with a foreign value of \$207,000-\$310,000 a year.

Summary of estimates.

The foregoing estimates are summarized below:

Wool tops: Summary of estimated post-war consumption, production, and imports under the assumptions of Senate Resolution 341

Period, income level, and tariff treatment	Consumption	Production			Imports		
		Quantity	Price per pound	Value	Quantity	Price per pound	Foreign value
	Million pounds	Million pounds	Million dollars	Million pounds	Million dollars	Million dollars	
1939	250-280	198.8	\$0.87	122.0	0.114	6.089	
Post-war long-term:							
Per capita income as in 1939:							
Duty as in 1939.....	210-280	210-280	.87	182-200	0.2-0.3	0.2-0.3	
Duty reduced by 50 percent.....	170-195	145-185	.80	116-148	10-25	7-17.5	
Duty increased by 50 percent.....	190-210	190-210	.95	180-200	0.1-0.15	0.115-0.175	
Per capita income 75 percent higher than in 1939:							
Duty as in 1939.....	250-280	280-280	1.12	280-314	0.2-0.4	0.26-0.43	
Duty reduced by 50 percent.....	200-230	175-220	1.05	180-227	10-25	9-22.5	
Duty increased by 50 percent.....	230-260	230-260	1.22	281-317	0.15-0.225	0.207-0.31	

¹ Estimated.

Exports

Exports have not been separately recorded in the past but are known to be small. Under the assumed conditions they will probably remain unimportant in the post-war period.

Employment

No pre-war data are available. The variations in post-war production estimated on the different assumptions regarding income and rates of duty would more or less correspondingly affect employment.

WOOL YARN

Tariff paragraph: 1107.**Commodity:** Yarns of wool, mohair, and similar fibers (not including Angora rabbit hair).**Rate of duty:** 30¢ to 40¢ per lb. + 30% ad val.**Equivalent ad valorem (1939):** 74%.

NOTE.—The duty on this commodity, as fixed in the Tariff Act of 1930, was 40 cents per pound plus 25, 45, or 50 percent ad valorem, according to value. Pursuant to the trade agreement with the United Kingdom, effective January 1, 1939, the specific portion of the rate was reduced to 20 cents on yarns valued at not more than 60 cents per pound and to 26 cents per pound on yarns valued at from 60 cents to \$1 per pound. The ad valorem rate on all yarns was reduced to 30 percent, regardless of value. The specific duty (26 to 40 cents a pound) is intended as compensatory for the duty on raw wool. A change in this part of the duty, which would be accompanied by a corresponding change in the wool duty, presumably would not alter the margin of protection afforded manufacturers in the United States.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	486, 943	70	486, 873	572	487, 445	6.1
Value (\$1,000).....	438, 249	72	438, 177	2, 456		
Unit value (per pound).....	\$0.90	\$1.03	\$0.90	\$0.80		
Persons employed (number).....	(¹)					

¹ Estimated.² Foreign value.³ Not separately reported. The employees shown in the report on woolen and worsted cloth include those engaged in spinning wool yarn.

There are two general systems of manufacturing wool yarn, the woolen system and the worsted system. Woolen yarn is spun directly from carded sliver; worsted yarn is spun from combed sliver and, being a more standardized product, is much more an article of commerce than woolen yarn. The small imports are practically all of worsted yarn to be used in the knitting or weaving industry. Imports have been received chiefly from the United Kingdom, and to a less extent, from other European countries and Japan. In the past imports have consisted of yarn of extremely high grade or of types not ordinarily produced in this country. They have been intended for sale here at prices considerably higher than the average for domestic production.

By far the bulk of the supply of wool yarn in the United States is produced by integrated mills which weave it into cloth on their own looms. Only 77 million pounds of wool yarn (valued at 86 million dollars) was reported as produced for sale in 1939. Of this quantity, 68 million pounds (88 percent) was worsted yarn, valued at 79 million dollars, or an average of \$1.16 per pound. The yarn manufactured for sale is obtained both from the large integrated mills and from concerns engaged exclusively in producing yarn. It is sold in about equal amounts to manufacturers of worsteds and the knit goods industry. Such competition as arises from imports is chiefly with yarns made for sale.

POST-WAR SHORT TERM

With the abnormal demand for woolen and worsted and other fabrics, consumption of yarn will probably be considerably above the 1939 level. Imports will probably remain relatively small.

POST-WAR LONG TERM**Consumption, Production, and Imports**

Consumption of wool yarn in the United States depends chiefly on domestic production of woven fabrics, although it is affected also by the production of knit goods. The production of woven fabrics may be affected by prices, which depend to some extent on the duties on raw wool, and by the competition of imported fabrics, which, in turn, depends to an appreciable extent on the duties on woven fabrics. In the report on woolen and worsted goods, estimates have been made of the effects of changes in national income and changes in rates of duty on the production of woven fabrics in the United States. The following estimates concerning the consumption of wool yarn in the United States are largely based on those estimates. Due regard has also been given to the probable consumption of yarns in the knit-goods industry.

Before the war imports of wool yarn were very small compared with domestic production. The same is likely to be the case after the war if the rates of duty are as in 1939, and of course also if the rates are increased. On the other hand, a reduction of 50 percent in the duty might result in very much larger imports, particularly as it would make possible the sale in this market of imported yarns of lower quality than heretofore.

Increase of imports as the result of a reduction in the duty on wool yarn would affect particularly the domestic producers of yarn for sale. If the duty were lower, some manufacturers of wool fabrics who now produce all of their yarn requirements might import part or all of those requirements. For the most part, however, an increase in imports would be accompanied by a corresponding decrease in the production of yarn for sale.

Per capita income at 1939 level.

Duties as in 1939.—It seems probable that the per capita consumption of wool yarn would remain about the same as in 1939, the total consumption increasing by reason of larger population. In view of various uncertainties as to causal factors, the probable consumption is best estimated as a range, say from 510–560 million pounds a year. Imports might be a somewhat larger proportion of consumption than in 1939, as forward contracts probably prevented imports in that year from showing the full effect of the reduction in duty on January 1, 1939, and the preparations for war in Europe operated to restrict the supplies available for shipment to this country. The quantity received might be twice as great as in 1939, or 1.0–1.2 million pounds which, at prices the same as in that year, or 80 cents a pound, would have a total foreign value of \$800,000–\$960,000 a year. The increased imports, however, would still represent only a fraction of 1 percent of the total supply, and production in the United States would be virtually equivalent to consumption or 510–560 million pounds, of which probably 85 million would consist of production for sale. At prices the same as in 1939, the estimated value of pro-

duction then would be 459-504 million dollars (90 cents a pound) and that of production for sale 95 million dollars (\$1.12 a pound).

Duties reduced by 50 percent.—Because of increased imports of wool fabric, upon which the duty also would be reduced, mill activity in the United States might be diminished, and the consumption of wool yarn decline to 450-550 million pounds a year. Of the reduced total, the proportion supplied by imports probably would be much larger than if the duty were unchanged. Imports might be 2-5 percent of consumption, and amount to 10-25 million pounds a year. The imports would have a lower unit value than with no reduction in the duties, because increased quantities of lower grade yarns would come in. The average unit value might be about 75 cents per pound, and the foreign value of the imports range from 7½-18½ million dollars. With the increase in imports, domestic production would be materially less than with the duty as in 1939.

Total production might be 425-540 million pounds, and production for sale 55-70 million pounds. As the result of lower prices of raw wool (because of reduction in the duty on that material), the average value of total production in the United States might be 15 cents a pound less and that of production for sale 17 cents a pound less than estimated with duties the same as in 1939. The estimated total value of production then would be 319-405 million dollars (75 cents a pound) and the estimated value of production for sale 52-67 million dollars (95 cents a pound).

Duties increased by 50 percent.—Duty increases on wool would probably operate to reduce the domestic production of fabrics, and consequently the consumption of wool yarn. The annual consumption of yarn might be 470-510 million pounds, or 8-10 percent less than estimated at 1939 rates of duty.

The increased duties on yarn would probably make the imports much smaller than with unchanged rates. They might amount to 500-600 thousand pounds, with an average unit value (somewhat higher than with no change in duty) of about 85 cents per pound, and a total foreign value of \$425,000-\$510,000 a year. Total production probably would remain about the same as consumption, and like consumption be 8-10 percent less than estimated at 1939 rates of duty, or 470-510 million pounds a year. Of the total quantity perhaps 75 million pounds would consist of production for sale. Chiefly because of higher prices of raw wool (as the result of higher duties on that material) the average value per pound of total production might be 13 cents greater, and that of production for sale 15 cents greater than estimated with duties the same as in 1939. The estimated total value of production then would be 484-525 million dollars (\$1.03 a pound) and the estimated value of production for sale 95 million dollars (\$1.27 a pound).

Per capita income 75 percent higher than in 1939.

The quantity of wool yarn consumed, at a given level of duties on wool yarn and fabrics, might be 20-25 percent greater than if per capita income remained as in 1939. Since the imported yarn is more of a luxury than the domestic product, imports might constitute a somewhat larger proportion of the consumption, under each of the three assumptions regarding rates of duty, than with income as in 1939, but the difference would probably be too small to warrant a definite estimate.

Chiefly because of the increase in the estimated price of raw wool, the price of wool yarn might be considerably greater than was estimated with per capita income the same as in 1939. The extent of the increase would vary with the proportion of raw wool contained, and might be 15-20 percent for total yarns produced in the United States, 18-25 percent for yarns produced for sale, and 30-33 percent for yarns imported.

The effects of a change of 50 percent in the rates of duty on the relation of imports to domestic production, and particularly to domestic production for sale, would probably be about the same under the higher income level as under the lower level. So, too, the effects of differences in rates of duty on the prices of domestic yarns produced for sale, and on the foreign prices of imported yarn, would presumably be parallel with those estimated for the lower income level.

Summary of estimates.

The foregoing estimates of consumption, production, and imports are summarized in tables 1 and 2.

TABLE 1.—Wool yarn: Summary of estimated quantities of post-war consumption, production, and imports under the assumptions of Senate Resolution 341

(In thousands of pounds)

Period, income level, and tariff treatment	Consumption	Production		Imports
		Total	For sale	
1939 (actual)	487, 445	1 486, 943	1 77, 194	572
Post-war long term:				
Per capita income as in 1939:				
Duty as in 1939	510, 000-690, 000	510, 000-690, 000	95, 000	1, 000-1, 200
Duty reduced by 50 percent	450, 000-568, 000	425, 000-540, 000	85, 000-70, 000	10, 000-25, 000
Duty increased by 50 percent	470, 000-510, 000	470, 000-510, 000	78, 000	800-800
Per capita income 75 percent higher than in 1939:				
Duty as in 1939	600, 000-690, 000	600, 000-690, 000	100, 000	1, 200-1, 300
Duty reduced by 50 percent	535, 000-670, 000	505, 000-655, 000	85, 000-80, 000	15, 000-30, 000
Duty increased by 50 percent	575, 000-650, 000	575, 000-650, 000	95, 000	600-700

1 Includes exports, amounting to 70,000 pounds.

TABLE 2.—Wool yarn: Summary of estimated value of post-war production and imports under the assumptions of Senate Resolution 341

Period, income level, and tariff treatment	Production				Imports	
	Total		For sale		Unit value	Value (foreign)
	Unit value	Value	Price per pound	Value		
1939	Per pound \$0.90	1,000 dollars 438, 249	\$1.12	1,000 dollars 95, 200	Per pound \$0.80	1,000 dollars 456
Post-war long term:						
Per capita income as in 1939:						
Duty as in 1939	.90	450, 000-504, 000	1.12	95, 200	.80	800-900
Duty reduced by 50 percent	.75	318, 750-405, 000	.95	82, 250-68, 500	.75	7, 500-15, 750
Duty increased by 50 percent	1.05	494, 100-535, 300	1.27	95, 250	.85	425-510
Per capita income 75 percent higher than in 1939:						
Duty as in 1939	1.05	630, 000-724, 500	1.35	135, 000	1.05	1, 200-1, 300
Duty reduced by 50 percent	.90	454, 500-580, 800	1.15	78, 700-94, 500	1.00	15, 000-30, 000
Duty increased by 50 percent	1.15	673, 500-757, 000	1.50	142, 500	1.10	600-770

1 Estimated.

Exports

Exports of wool yarn have been relatively small and almost entirely confined to countries in the Western Hemisphere. They were abnormally large in 1939; 65 percent of the total went to Switzerland, a country previously importing very little yarn from this country. Exports are expected to remain small in the post-war period.

Employment

Data on employment are included in those shown in the report on woolen and worsted cloth.

YARNS OF ANGORA RABBIT HAIR

Tariff paragraph: 1107.

Commodity: Yarns wholly or in chief value of Angora rabbit hair.

Rate of duty: 40¢ per lb. + 25% ad val. *Equivalent ad valorem (1939):* 31%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 40 cents per pound plus 35, 45, or 50 percent ad valorem, depending on the value bracket. Pursuant to the trade agreement with France, effective June 15, 1936, the rate was reduced to 40 cents per pound plus 25 percent, without regard to value brackets.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	80
Value (\$1,000).....	1 506
Unit value (per pound).....	\$6.35

¹ Foreign value.

The discussion below of post-war probabilities is based upon the assumption that Angora rabbit hair will occupy about its average style position. With styles markedly more favorable or unfavorable than usual the probabilities might be far different from those indicated.

Angora rabbit hair yarn is usually sold for hand-knitting into articles such as gloves, scarfs, and berets, and for edgings or trimming material for children's garments. The yarns are also employed on knitting machines in the manufacture of high-priced knit outerwear, largely for infants. Because of its high price and because of the tendency of individual hairs to become detached, Angora rabbit hair in yarn is usually blended with either wool, mohair, cashmere, or rayon staple fiber.

Practically the entire United States consumption is imported. France is ordinarily the principal source, followed by the United Kingdom and Belgium.

The yarn produced in the United States is different from that imported, and the quantity produced is so small as to be negligible.

POST-WAR SHORT TERM

Imports from Europe will probably be resumed soon after commercial facilities are restored. Supplies may be somewhat greater immediately after than before the war, because of the need to replace depleted stocks in the United States.

POST-WAR LONG TERM

Per capita income at 1939 level.

Duty as in 1939.—Per capita consumption might remain at the pre-war level, but, allowing a 10-percent increase in population, imports

might rise to about 90,000 pounds, with a foreign value of about \$575,000, assuming approximately the same price as in 1939.

Duty reduced by 50 percent.—Per capita consumption might increase over 1939 by about 20 percent, resulting in imports of possibly 100,000 pounds, with a foreign value of \$635,000–\$650,000 a year.

Duty increased by 50 percent.—The higher duty might result in a decrease in consumption and imports might decline by about 10 percent, or to about 70,000 pounds, with a foreign value in the neighborhood of \$450,000 a year.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—With a higher income, imports might increase say about 40 percent above the per capita level of 1939 and might be possibly 120,000 pounds, with a foreign value of \$750,000–\$800,000 a year.

Duty reduced by 50 percent.—The per capita consumption might increase 50 percent above the 1939 level or to 130,000–140,000 pounds, with a foreign value of \$825,000–\$900,000 a year.

Duty increased by 50 percent.—Consumption would probably be at about the same per capita level as in 1939 or possibly 10 percent less. Imports would probably be in the neighborhood of 80,000 pounds, with a foreign value of \$500,000–\$525,000 a year.

WOOLENS AND WORSTEDS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1108.....	Worsteds weighing not more than 4 ounces per square yard.	40¢ or 50¢ per lb. and 37½% ad val.	65.3%.
1109 (a).....	Woolens and worsteds weighing more than 4 ounces per square yard.	40¢ per lb. and 45% ad val., or 50¢ per lb. and 35% or 40% ad val.	75.4%.
Average.....			75.1%.

Note.—The rates fixed in the Tariff Act of 1930 were 40 or 50 cents per pound plus 50, 55, or 60 percent ad valorem, according to value bracket, on fabrics weighing not more than 4 ounces per square yard; on fabrics weighing more than 4 ounces per square yard the duties were 50 cents per pound plus 50, 55, or 60 percent ad valorem, according to value bracket. The specific (cents per pound) portion of the compound duties levied on manufactures of wool is intended as compensatory for the duty on raw wool; the ad valorem portion is intended as the protective rate. Pursuant to the trade agreement with the United Kingdom effective January 1, 1939, the ad valorem rates on the light fabrics (4 ounces or less per square yard) were all reduced to 37½%, with no change in specific rates; on the heavier fabrics (over 4 ounces per square yard) the specific rate was reduced from 50 to 40 cents per pound and the ad valorem rate from 60 to 45 percent on certain fabrics valued at 80 cents per pound or less; all other ad valorem rates were reduced to 35 or 40 percent, with no change in specific rates.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	393, 967	310	393, 637	6, 626	215, 263	Percent 2.1
Value (\$1,000).....	408, 541	440	408, 101	8, 804		
Unit value (per pound).....	\$1.29	\$1.42	\$1.32	\$1.32		
Persons employed (number).....	149, 915					

¹ Foreign value.

United States production of woolens and worsteds reached a peak with 344 million pounds in 1923, declined to 194 million pounds in 1931, and increased to 314 million pounds in 1937. In 1942 production attained a record of about 450 million pounds.

Imports of woolens and worsteds reached a peak with 20 million pounds in 1915, were about 11 million pounds in 1923, declined to less than 2 million pounds in 1932, and increased to 5.6 million pounds in 1937 and 6.6 million pounds in 1939. Imports are supplied mainly by the United Kingdom, with relatively small amounts in pre-war years from France, Belgium, and Germany; in 1936-39 there were also small imports from Japan.

Domestic production is mainly of medium-priced fabrics such as constitute the bulk of the demand; the output of high-priced fabrics is relatively small. Imports are mainly high-priced fabrics, such as fine worsted suitings and all-wool woolen overcoatings, but include some low-priced specialties such as coarse tweeds. Most of the imported fabrics are sold on a prestige basis, at higher prices than the nearest comparable domestic fabrics.

According to the latest census of production for the United Kingdom, the production of woolens and worsteds in that country in 1937 amounted to 283,808,000 pounds, valued at \$252,381,000, or 89 cents a pound. Production of woolens and worsteds in the United States in 1937 amounted to 314,228,000 pounds, valued at \$460,628,000, or \$1.47 per pound.

Before the war the United Kingdom normally supplied about two-thirds of the international trade in woolens and worsteds and was followed as an exporter by Italy, Germany, France, and Belgium.

In the 1920's and 1930's the introduction of automatic broad looms reduced substantially the amount of labor required in weaving in the United States. One weaver can attend only 1 or 2 non-automatic looms but can attend as many as 4 to 6 automatic looms working on woolens and as many as 6 to 12 working on worsteds. Of the 39,000 woolen and worsted looms in the United States industry in 1941, 28,000, or 72 percent, were automatic; probably as much as 90 percent of the worsted looms and about 50 percent of the woolen looms were automatic. It has been estimated that of the total 98,000 broad and narrow looms in the British industry, only 10 to 15 percent are automatic. It seems likely that after the war the British will increase the percentage of automatic looms used by them.

POST-WAR SHORT TERM

Wartime restrictions on the production of woolens and worsteds for civilian use, the requirements of demobilized troops, and export demands (both for sale and for relief) will create an abnormal demand for these fabrics at the close of the war.

It is probable that imports into the United States in the immediate post-war period will be relatively small because of the need in England to replenish domestic supplies which have become depleted. Under wartime policy in England, only the most efficient plants were allowed to operate and the number of operatives was reduced drastically, possibly one-half, and for this reason it may require 1 to 2 years to reestablish the industry in that country on a peacetime basis.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—Average annual consumption might be 5-15 percent greater than in 1939, and thus fall within the range of 330-360 million pounds a year. Factors favoring an increase in consumption are the population increase and a possible increase of imports as the result of the duty reductions made on January 1, 1939, which may not have exerted their full influence on imports during that year; a factor operating in the opposite direction is the possible increase in competition of other textiles. Imports (6.6 million pounds in 1939) might be 2-4 percent of consumption, averaging 6-14 million pounds annually (the wide range being due to uncertainty regarding the effect of the duty reductions of 1939). Production would then fall to 315-355 million pounds. Prices, both of imports and of the domestic product, would probably be about the same as in 1939, so that the foreign value of imports might be 8-19 million dollars, and the value of production 415-470 million dollars.

Duty reduced by 50 percent.—It is assumed in the following paragraphs that a reduction or increase of 50 percent in the duties on woolens and worsteds would be accompanied by a similar percentage change in the duties on raw wool, which in turn would affect the cost of raw wool to domestic manufacturers, and consequently the costs and prices of domestic woolens and worsteds. The present duty on apparel wool, scoured, is 34 cents per pound, but on account of wastage in manufacture this rate is equivalent to approximately 50 cents on the quantity of wool used in a pound of cloth. However, the duties on raw wool in the past have seldom been fully effective, the prices of domestic wools exceeding the delivered prices of foreign wools (ex-duty) by less than the amount of the duties. A change in the duties on wool would therefore probably result in somewhat less than corresponding changes in the costs and prices of woolens and worsteds produced in this country. It is possible, however, that a reduction or increase in the ad valorem part of the duties on woolens and worsteds would further lower or raise the prices of domestic fabrics of the grades most subject to the competition of imports.

The average of the five compound rates of duty applicable to imports of woolens and worsteds under the Tariff Act of 1930, through the year 1938, was 50 cents per pound plus 56 percent ad valorem; the two rates combined were equivalent to a specific rate of \$1.40 per pound or an ad valorem rate of 87 percent. Under the agreement with the United Kingdom, effective January 1, 1939, the average of these rates in 1939 was 48 cents per pound plus 39 percent ad valorem, together equivalent to a specific rate of \$1.00 per pound or to an ad valorem rate of 75 percent. A 50 percent reduction would make the average rates 24 cents per pound plus 19½ percent ad valorem, equivalent to a specific rate of 50 cents per pound or (on the basis of the average foreign unit value of \$1.33 per pound in 1939) to an ad valorem rate of 37½ percent.

The average unit value of United States production in 1939 was \$1.32 per pound. With a reduction of 50 percent in the duties on raw wool and on woolens and worsteds, the average price of the

domestic product might fall to \$1.05-\$1.15 per pound. Such a reduction in prices would tend to increase consumption considerably, compared with consumption under an unchanged rate of duty; it might be from 5-10 percent greater. The total quantity of consumption thus might be 345-400 million pounds.

With a 50-percent reduction in the duties on woolens and worsteds, imports would no longer be confined to high-grade and special fabrics sold here at prices higher than those of the most nearly comparable domestic products, but would broaden so as to include considerable quantities of medium-grade fabrics similar to those which constitute the bulk of United States production. It is improbable, however, that foreign producers would be enabled to expand materially their sales in the United States market for most classes of fabrics below the medium grade, which constitute a considerable part of the domestic output. Imports at the reduced duties might become 12-17 percent of the consumption, or 40-70 million pounds. In that case the domestic production would be 285-350 million pounds.

On the basis of the above estimate as to the average unit price of domestic fabrics under the reduced duties (\$1.05-\$1.15 per pound), the value of the domestic production would be 300-400 million dollars. The extension of the scope of imports by the inclusion of medium-grade fabrics would lower the average foreign unit value, which had been \$1.33 per pound in 1939, to perhaps \$1.15-\$1.25. In that case the foreign value of the imports would range from 46-87 million dollars.

Duty increased by 50 percent.—An increase of 50 percent in the duties on raw wool would necessitate a considerable advance in the price of domestic woolens and worsteds, and an increase of 50 percent in the duties on woolens and worsteds would also tend further to raise the prices of the highest grades of domestic fabrics (this effect, however, would be relatively insignificant). The average price of the domestic product (\$1.32 per pound in 1939) might rise by 10 or 15 percent, say to \$1.45-\$1.55 per pound. Such an increase in price might tend to discourage consumption, and cause greater substitution of other textiles. As a consequence the total consumption might be from 5 to 10 percent less than with an unchanged duty, or 310-330 million pounds.

With an average duty of 72 cents per pound plus 58½ percent ad valorem (equivalent to a specific rate of \$1.50 per pound or to an ad valorem rate of 112½ percent) imports would decrease sharply, and be confined to the very finest and highest priced specialities. They would probably not exceed 1 or 2 percent of consumption, amounting to 3-7 million pounds, with a foreign value (on the basis of unit values of \$1.50-\$1.75) of 4-12 million dollars. Production would be but little less than the estimated consumption, or about 300-325 million pounds, which at the enhanced unit prices above estimated would have a value of 435-500 million dollars.

Per capita income 75 percent higher than in 1939.

Although the demand for woolens and worsteds is not so greatly affected by changes in national income as that for more strictly luxury products and for capital goods, the quantities consumed under a high

national income would be decidedly larger than with income as in 1939. Moreover, there would be a tendency toward a larger proportion of the higher priced fabrics in the consumption. It seems likely that, on this assumption as to income, consumption, at a given rate of duty, would be 20-35 percent greater, in quantity, than with income at pre-war levels. With the rates of duty as in 1939, consumption might thus be 400-450 million pounds.

Since luxury types of cloth are relatively more important in imports than in domestic production, the share of consumption supplied by imports would be somewhat higher than would be the case if income remained unchanged. Assuming rates of duty the same as in 1939, imports would probably supply 2-5 percent of consumption, totaling 10-22 million pounds. The balance supplied by domestic production would be 380-440 million pounds.

A high national income, particularly since it is assumed that there would be a similar increase in income in foreign countries, would doubtless carry with it higher prices for raw wool, higher wages and other costs of manufacture, and higher prices for fabrics, than those that would prevail with no change in national income. These higher prices would enhance the values both of domestic production and of imports. For example, whereas the average value of domestic production of woollens and worsteds in 1939 was \$1.32 per pound, it is probable that, with no change in rates of duty, the average value in the post-war period, on the assumption of an increase of 75 percent in per capita income, would be \$1.50-\$1.60 per pound; the average foreign unit value of imports would also rise to about the same figures.

Summary of estimates.

As with the assumption of a national income the same as in 1939, so with the assumption of a high national income, a reduction of 50 percent in duties, assumed also to apply to raw wool, would result in average unit values of domestic fabrics decidedly lower than those that would apply if duties remained unchanged. Similarly, an increase in duties would tend to make the average unit values higher. Reduction in unit values would tend to increase consumption, and advance in unit values would tend to decrease consumption.

The effects of changes in duty on imports and production at the high income level would be substantially parallel to those at the lower level. With duties reduced 50 percent, imports would be much greater, and production somewhat smaller, than with duties the same as in 1939. With duties increased by 50 percent, imports would be considerably smaller and production moderately larger than with no change in duty. In table 1 estimates are presented of the quantity of consumption, imports, and production under each of these assumptions.

The effects of a reduction or an increase in duties on unit values of domestic and imported fabrics and, consequently, on the total value of production and of imports, would parallel those already discussed under the first assumption as to income. Table 2 presents estimates of unit values and total values under each of these assumptions.

TABLE 1.—Woolens and worsteds: Summary of estimated quantities of post-war consumption, imports, and production under the assumptions of Senate Resolution 341

[Quantity in millions of pounds]

Income level and tariff treatment	Consumption	Imports	Ratio of imports to consumption	Production
Per capita income same as in 1939:			Percent	
Duty as in 1939	330-300	6-14	2-4	315-355
Duty reduced by 50 percent	345-400	40-70	12-17	285-350
Duty increased by 50 percent	310-320	3-7	1-2	300-325
Per capita income 75 percent higher than in 1939:				
Duty as in 1939	400-450	10-22	2-5	380-440
Duty reduced by 50 percent	425-500	65-100	15-20	340-425
Duty increased by 50 percent	375-425	7-13	2-3	355-410

TABLE 2.—Woolens and worsteds: Summary of estimated value of post-war production and imports under the assumptions of Senate Resolution 341

Income level and tariff treatment	Production			Imports		
	Quantity	Unit value	Value	Quantity	Unit value	Value (foreign)
Per capita income same as in 1939:	Million pounds	Per pound	Million dollars	Million pounds	Per pound	Million dollars
Duty as in 1939	315-355	\$1.32	415-470	6-14	\$1.23	8-19
Duty reduced by 50 percent	285-340	1.05-1.15	300-400	40-70	1.15-1.25	46-87
Duty increased by 50 percent	300-325	1.45-1.55	435-500	3-7	1.50-1.75	4-12
Per capita income higher than in 1939:						
Duty as in 1939	390-440	1.50-1.60	570-704	10-22	1.50-1.60	15-35
Duty reduced by 50 percent	340-425	1.20-1.40	408-595	65-100	1.30-1.45	84-145
Duty increased by 50 percent	365-410	1.65-1.85	602-758	7-13	1.70-2.00	12-26

Exports

United States exports of woolens and worsteds totaled 7,853,000 pounds, valued at \$24,259,000, in 1920; decreased to 47,000 pounds, valued at \$74,000, in 1933; recovered to 310,000 pounds, valued at \$439,000, in 1939; and reached a new record with 30,721,000 pounds valued at \$53,517,000 in 1943. The latter were mainly military fabrics for allied countries.

Ordinarily, United States exports of woolens and worsteds are less than 1 percent of the domestic production, and go mainly to adjacent countries (Canada, Cuba, and Mexico). American prices are much higher than those abroad and there is little prospect of building up any substantial export trade in peacetime. Large exports have been possible only during world wars and their aftermath when price becomes a secondary factor.

During and immediately after World War II there will be a demand for all the woolens and worsteds that can be spared from the domestic market, but exports in the long-term period will probably be very small.

Employment

The average number of wage earners in the woolen and worsted industry increased from approximately 150,000 in 1939 to 167,000 in 1943 and during the same period average hours per week rose from 36.4 in 1939 to 41.6, an over-all increase in man-hours of about 27

percent. The production of woven goods (linear yards) was 44 percent greater in 1943 than in 1939.

In the immediate post-war period, employment will be high and may approach the level of 1943. On the long-term basis, employment may be from somewhat below the 1939 level to 25 or 30 percent above it, depending on national income and on rates of duty.

PILE FABRICS OF WOOL OR HAIR

Tariff paragraph: 1110.

Commodity: Pile fabrics wholly or in chief value of wool or hair.

Rate of duty: 44¢ per lb. + 40% ad val. Equivalent ad valorem (1939): 81%

NOTE.—The rates fixed in the Tariff Act of 1930 were 44 cents per pound plus 50 or 55 percent ad valorem. (The specific portion of the duty (44 cents per pound) is intended as compensatory for the duty on raw wool (including mohair).) The ad valorem portion of the rates was reduced to 40 percent, effective January 1, 1939, pursuant to trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	22,206	0	22,206	257	22,463	Percent 1
Value (\$1,000).....	21,374		21,374	278		
Unit value (per pound).....	\$0.95		\$0.96	\$1.08		
Persons employed.....	(¹)					

¹ Estimated.
² Foreign value.
³ Not separately recorded. Included with 149,915 persons employed in the woolen and worsted industry.

Pile fabrics of wool or hair produced in the United States consist mainly of mohair pile fabrics for use as upholstery in automobiles, busses, and railway cars (especially Pullmans). In recent years they have included an increasing proportion of blended fabrics of mohair and rayon. Imports are mainly Jacquard-woven fabrics for the furniture trade; they are of high average quality and have a landed value from two to four times as great as the average value of production in this country. The principal sources of imports have been the United Kingdom, Poland, Czechoslovakia, and France.

Production abroad, unlike that in the United States, consists largely of specialties upon which relatively short runs are obtained, and as a result, foreign prices are comparatively high. In the United Kingdom, for example, the production in 1937 (9,322,000 pounds) had an average value of \$1.14 per pound, compared with \$1.10 in the United States.

Production in the United States has fluctuated with automobile production. Because of its durability, pile fabric is used extensively as upholstery material for low-priced cars, in which resale value is an

important consideration. In the more expensive cars, however, it is gradually being displaced by other fabrics.

Imports have fluctuated owing to changes in fashion affecting the demand for expensive upholstery materials in furniture manufacture. Imports declined from 192,000 pounds with a foreign value of \$467,000 in 1929 to 11,000 pounds with a foreign value of \$23,000 in 1933, but subsequently they increased until they reached a peak in 1938, of 453,000 pounds, with a foreign value of \$500,000.

In the estimates which follow, it is assumed that the fashion considerations affecting imports and the relation of production in the United States to automobile production will remain approximately the same as in 1939. Because of the unpredictability of fashion in the one case, however, and the competition of nonpile fabrics in the other, these estimates contain a large possible margin of error.

POST-WAR SHORT TERM

As a result of the probable increase in automobile production, the consumption of pile fabrics of wool or hair will probably be considerably higher than in 1939. Imports probably will be small because of the time which will be required to rehabilitate foreign mills and to meet accumulated needs abroad.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

On the assumption that automobile production will be 15-25 percent greater than in 1939, a similar increase in the consumption of pile fabrics may be assumed, causing the quantity consumed then to rise to, say, 25-30 million pounds a year. A decrease or an increase of 50 percent in the import duties would probably affect the quantity of consumption only slightly. It would probably also affect the quantity of production only slightly but might materially affect the value of production because of the 50-percent change in the duty on mohair. The quantity of production would be only a quarter to a half million pounds less than consumption depending on the assumptions as to duty.

Duty as in 1939.—Imports might supply about the same proportion of consumption as in 1939, 1 percent, and amount to 250,000-300,000 pounds with a foreign value of \$270,000-\$320,000 a year, assuming prices to be the same as in 1939. Upon the same assumption as to price, the total value of production would be 24-29 million dollars a year.

Duty reduced by 50 percent.—Imports probably would be restricted to specialties and expensive upholstery materials, as heretofore, but the sale of these materials might be increased considerably as the result of lower prices. The quantity received might be 2 percent of consumption or in the neighborhood of 500,000 pounds, which (assuming a slightly lower average quality and foreign unit value) would have a total foreign value of about \$500,000 a year.

Principally because of reduced duties on mohair, raw-material costs and consequently the average value of production for the fabrics here considered might be reduced as much as 22 cents a pound. In this event the total value of production would be 18-22 million dollars a year, or about 25 percent less than if the duty were unchanged.

Duty increased by 50 percent.—Because of higher raw-material costs, which increased duties on mohair would produce, the average value of the fabrics here considered might be increased a maximum of 22 cents a pound, in which case the total value of production would be 30-35 million dollars a year. Imports probably would be very small, less than 1 percent of consumption, and would be restricted, to an even greater extent than in the past to high-priced articles and specialties. They might be in the neighborhood of 150,000 pounds with a foreign value of \$200,000 a year, and be about 45 percent less in quantity and 33 percent less in value than if the duty were unchanged.

Per capita income 75 percent higher than in 1939.

As a result of the increased production of automobiles, the consumption of pile fabrics of wool or hair might be 40 to 50 percent greater than if per capita income were the same as in 1939. In this event, it would be 36-43 million pounds a year. Imports, as the result of a greatly increased demand for luxuries, might be 100-150 percent greater in quantity under each of the three assumptions as to duty than at the lower level of income. Because of generally increased prices, and increased prices for raw wool (including mohair) in particular, the average value of both production and imports possibly would be about 20 percent greater, under each assumption as to duty, than was estimated previously with per capita income the same as in 1939.

The quantity of production in the United States would be only a half million to a million and a quarter pounds less than consumption. Estimates of the value of production, and of the quantity and value of imports, based on the considerations stated above, are given as follows:

Duty as in 1939.—Imports possibly would be 550,000-700,000 pounds with a foreign value of \$700,000-\$900,000 a year. The value of production might be 40-50 million dollars a year.

Duty reduced by 50 percent.—Imports possibly would be 1,000,000-1,250,000 pounds with a foreign value of 1.2-1.5 million dollars a year. The value of production might be 32-38 million dollars a year.

Duty increased by 50 percent.—Imports possibly would be 300,000-375,000 pounds, with a foreign value of \$470,000-\$600,000 a year. The value of production might be 50-60 million dollars a year.

Employment

Statistics of employment are not reported separately.

WOOL BLANKETS AND SIMILAR ARTICLES

Tariff paragraph: 1111.

Commodity: Blankets and similar articles (including carriage and automobile robes and steamer rugs) wholly or in chief value of wool, not exceeding 3 yards in length.

Rate of duty: 30¢ to 40¢ per lb. + 35%. *Equivalent ad valorem (1939):* 84%.

Note.—The Tariff Act of 1930 imposed rates ranging from 35 cents per pound plus 35 percent ad valorem to 40 cents per pound plus 40 percent ad valorem, depending on value. Pursuant to the trade agreement with the United Kingdom, effective January 1, 1939, the ad valorem rates were reduced to 35 percent on all brackets, without change in the specific rates. The rates on hand-woven blankets and similar articles were reduced to 20 cents per pound plus 25 percent ad valorem under the agreement with Mexico, effective January 20, 1943.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For domestic market ¹			
Quantity (1,000 lb.).....	28,200	28,200	408	28,777	Percent ²
Value (\$1,000).....	25,510	25,510	1,286		
Unit value (per lb.).....	\$0.90	\$0.90	\$0.63		
Persons employed (number).....	(7)				

¹ Exports were negligible.

² Foreign value.

³ Not available. Included with the 149,915 persons employed in the woollen and worsted industry.

For the purposes of this report "wool blankets" include all-wool blankets and mixed wool-and-cotton and mixed wool-and-rayon blankets with a content of 25 percent or more in weight of wool.

Wool blankets are produced by the woollen branch of the wool manufacturing industry. In addition to production by mills normally engaged in blanket manufacture, there is sometimes a considerable production by woollen mills with looms of 82-inch reed space or over.

During the 1930's the production of all-wool blankets remained rather constant, around 10.5 million pounds annually. The production of part-wool blankets declined from 30.9 million pounds in 1929 to 26 million pounds in 1931 and still further in succeeding years to 18 million pounds in 1939. The combined production of wool and part-wool blankets declined even with the increasing income after 1932. This decrease may be attributed to the competition of all-cotton blankets, the production of which increased from 29 million pounds in 1929 to 41 million in 1939.

Imports, mainly from the United Kingdom and the Netherlands, are principally bed blankets, but include steamer rugs, automobile robes, and a well-known type of camp blanket. They are generally sold in this country at prices considerably above the average for similar articles produced here. The quantity of imports declined from 769,000 pounds in 1929 to 122,000 in 1934, but later increased to 877,000 in 1937. Imports in 1938 and 1939 (between 400,000 and 500,000 pounds) were considerably less than in 1937.

During the war, imports have been reduced further, but the needs of the armed forces have caused a marked increase in domestic output. As compared with 28 million pounds in 1939, production was 105 million pounds in 1943, of which 90 million pounds were for Government agencies. Part of the increase was from the output of wool carpet and rug mills, temporarily engaged in producing blankets under Government contract.

POST-WAR SHORT TERM

Restrictions placed on the production of wool blankets for civilian use and the decline in imports during the war may cause an increase in consumption in the immediate post-war period. Production may be 20 percent more than in 1939. It is probable that imports will be small because of the need of England and other European countries to replace stocks which have become depleted.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of wool blankets might be 29-33 million pounds a year, depending in part on the assumed rates of duty, and the resulting level of prices.

Duty as in 1939.—Because of the population increase, consumption might be 10 percent greater in quantity than in 1939, or about 31.5 million pounds, of which production might supply 31 million pounds and imports 500,000 pounds, or 1.6 percent of consumption. Average unit values might be about the same as in 1939, in which case the total value of production would be 28 million dollars and the foreign value of imports \$315,000 a year.

Duty reduced by 50 percent.—Because of lower prices, consumption might increase to 32½ million pounds. Production might be in the neighborhood of 30 million pounds a year. The average unit value of production, however, probably would be reduced because of the lower price of raw wool, as a result of the reduction in the duty on that material, and of the reduction in the protective duty on blankets. The average unit value of production would then be about 20 cents a pound less than with the duty unchanged, or 70 cents a pound, and the total value of production would be about 21 million dollars a year.

Imports might increase to 2½ million pounds a year, or 5 times greater than if the duty were unchanged and equal 7.7 percent of consumption. Imports would not be restricted to the same extent as before to quality merchandise and specialties. Accordingly the foreign unit value would be reduced, and it might be only 60 cents a pound. The total foreign value of imports would then be 1½ million dollars a year.

Duty increased by 50 percent.—The higher prices which would result from increased duties, particularly on raw wool, would probably make the quantity of production and consumption lower than with duties as in 1939. Consumption might amount to 29.2 million pounds, of which 29 million pounds would come from domestic sources. The in-

creased duties on raw wool might cause the average unit value of production to be 15 cents a pound greater than with the duty unchanged, namely, about \$1.05 a pound. The total value of production would then be 30 million dollars a year. To a still greater extent than at the existing rate of duty, imports would be restricted to merchandise of high quality and specialties. The total amount imported might be in the neighborhood of 200,000 pounds, or 0.7 percent of consumption, with a foreign value of \$150,000.

Per capita income 75 percent higher than in 1939.

Consumption of wool blankets possibly would be about 10 percent greater than if per capita income were unchanged, and range between 32 million and 36 million pounds a year, depending in part on the rates of duty and the resulting level of prices in the United States. Because of higher prices (particularly for raw wool) the average unit value of both production and imports, under each of the three assumptions as to duty, is assumed to be 20 percent greater than was estimated with per capita income as in 1939.

Duty as in 1939.—Consumption might amount to 35½ million pounds. On account of a relatively great increase in the demand for specialties and high-priced articles, imports might be 2½ times as great in quantity as at the 1939 level of income, and amount to 1,250,000 pounds, or over 3 percent of consumption, and have a foreign value of 0.9–1.0 million dollars a year. Production might be only about 8 percent greater in quantity than if per capita income were unchanged, possibly totaling 34 million pounds, valued at 36 million dollars a year.

Duty reduced by 50 percent.—Consumption might increase to 36½ million pounds. As imports would contain a somewhat larger proportion of moderately priced articles than at the existing rate of duty, they probably would not respond so sharply to the increase of the per capita income. They might possibly be about 40 percent greater in quantity than if income were unchanged, and amount to 3½ million pounds, or 9.6 percent of consumption, with a foreign value of 2½ million dollars a year. Production in the United States possibly would be about 33 million pounds, valued at 27.7 million dollars a year.

Duty increased by 50 percent.—The small quantity of high-priced articles and luxuries received at this rate of duty might be four times as great as with per capita income the same as in 1939, in which case it would amount to 800,000 pounds, or 2.5 percent of consumption, with a foreign value of possibly \$720,000 a year. Consumption might amount to 31.8 million pounds a year, of which production in the United States possibly would be about 31 million pounds, valued at 39 million dollars a year.

Exports

Exports of wool blankets are not separately reported but are known to be negligible.

WOOL HOSIERY

Tariff paragraph: 1114 (b).
 Commodity: Hosiery, wholly or in chief value of wool (not embroidered).
 Rate of duty: 40¢ per lb. + 35%; 50¢ per lb. + 25% or 35% ad valorem. Equivalent ad valorem (1939): 56% (average).

NOTE.—The rates fixed in the Tariff Act of 1930 were 40 cents per pound plus 35 percent ad valorem on hosiery valued up to \$1.75 per dozen pairs, and 50 cents per pound plus 50 percent on hosiery valued over \$1.75 per dozen pairs. The duty on wool hosiery valued at more than \$1.75 per dozen pairs was changed in the trade agreement with the United Kingdom, January 1, 1939, to 50 cents per pound plus 35 percent if valued not over \$3, and to 50 cents per pound plus 25 percent if valued at more than \$3 per dozen pairs. The rate on wool hosiery valued at not more than \$1.75 was not changed.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 doz. prs.).....	1,316	(²)	1,316	272	1,588	Per cent 17
Value (\$1,000).....	3,062	(³)	3,062	⁴ 692		
Value (per doz. prs.).....	\$2.33	(³)	\$2.33	\$2.54		
Persons employed (number).....	⁴ 700					

¹ In addition, 251,000 dozen pairs, of hosiery made of wool mixed with cotton, valued at \$415,000, were produced in 1939. Hosiery of wool combined with silk or with rayon was included in data not specified by materials in the census for 1939. Cotton-and-wool hosiery and hosiery not specified by materials are treated, in this series, with cotton hosiery.

² Exports are not reported separately but are known to be negligible.

³ Foreign value.

⁴ Estimated.

The consumption of wool hosiery in the United States fluctuates widely but since 1929 has accounted for only about 1 percent or less, in quantity, of the total consumption of hosiery of all materials. In the period 1919-39, consumption of wool hosiery ranged from 500,000 dozen pairs (1931) to about 2 million dozen pairs (1921). Weather, style, changes in habits, and the income level are the principal factors which determine the quantities of wool hosiery consumed.

Domestic wool hosiery is predominantly for men. In 1939 men's half-hose constituted 40 percent of the total United States output, and men's "bundle goods," 59 percent, with respective average values per dozen pairs of \$3.03 and \$1.81.¹ Heavy types for outdoor wear, coarse-wool sport socks, and medium qualities of half-hose have always been supplied by the small domestic industry. Before the development of special British machines on which seamless half-hose of both fine and medium qualities could be made, imports from the United Kingdom consisted almost entirely of full-fashioned fine wool socks. The popularity of wool half-hose was so increased that some of the British machines were imported but not in sufficient

¹ "Bundle goods" are cheap qualities which are not boxed for shipment. Some are made of duty-free imported wools.

number to meet the demand for the hose. Subsequently, the building of this type of machine in the United States had expanded the domestic capacity for wool dress half-hose. The equipment can also be used to knit hosiery other than wool.

Imports are chiefly of men's hosiery, but imports of anklets for women and children have increased in recent years. In the 5 biennial census years 1931-39, total imports averaged 25 percent of apparent consumption, ranging from 16 percent (1935) to 43 percent (1931). In those years the quantity imported averaged 235,000 dozen pairs with a foreign value of \$682,000 (\$2.90 per dozen pairs). Maximum imports (1937) amounted to 312,000 dozen pairs, valued at \$843,000. Imports had been larger and the foreign value per dozen pairs much higher in the 1920's when golf hose were popular. The average foreign value per dozen pairs imported is usually higher than the domestic mill value. More than 90 percent of the imports come from the United Kingdom, which is the world's largest producer of wool hosiery (over 12 million dozen pairs annually, of which about 10 percent is exported). The United Kingdom has the largest home market for wool hosiery and wool yarns; and it has many skilled workers, a large machine industry interested in improving wool hosiery equipment, and the added advantage of world-wide prestige for British wool goods, especially men's wear. The British industry doubtless would expand to supply a demand sustained at a level beyond its present capacity. Germany, second in world production and in international trade before the war (though far below the United Kingdom) was second in importance as a source of United States imports. Japan, which was building up a worsted industry, exported one-fourth of a million dozen pairs in 1935, a small part of which were shipped to the United States.

In 1939, domestic production of wool hosiery was far above that in any preceding census year as far back as 1923. Because of war requirements production has continued at a high level. Post-war demand may continue at a high level as the result of a preference for wool hosiery developed by men in the armed services, by continuance of demand for sports-wear, or by the emergence of new styles.

Weather plays an important part in determining the output of wool hosiery; a cold winter will deplete stocks, whereas a warm one will cause them to pile up, with resulting fluctuations in production of as much as 30 percent. An expanded domestic market would stimulate the interest of domestic hosiery manufacturers if they could produce in quantities commensurate with United States production methods. They are not usually interested in supplying small quantities of a particular design or type. In the aggregate, small orders, which are filled by foreign manufacturers, often amount to a substantial quantity and value within a year. For large-scale production, the principal disadvantage to the United States manufacturer is the high price of worsted yarn.

A wider acceptance of wool hosiery depends partly on the price of other hosiery, but even more on future success in lessening shrinkage. Fibers simulating wool may, of course, be used increasingly in the hosiery field; the estimates made in this discussion are predicated on wool-type hosiery at prices per dozen pairs approximating those assumed for wool hosiery on the basis of 1939 prices, which were

low. The unit values, of both imports and domestic goods have declined greatly since the 1920's not only in keeping with the general price decline but also because of the shift from golf hose to anklets and socks, production of which requires less wool and less labor.

POST-WAR SHORT-TERM

After the war, there is likely to be a continued demand for wool hosiery because so many men will have become accustomed to wool socks. The demand for wool socks for sports, such as indoor skating, will also probably continue. Moreover, production of anklets continues to increase, although the style has long since been considered to have reached its peak. Total consumption of wool hosiery in the immediate post-war years will be relatively high. Manufacturers do not expect Army and Navy surplus supplies of hosiery to affect the market adversely after the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Although consumption of wool hosiery in 1939 was far above that in any preceding census year as far back as 1923, it is assumed that consumption will be at about the same or a little higher level. Aggregate consumption might be increased slightly by a reduction in duty.

Duty as in 1939.—Consumption might be about 1.6 million dozen pairs. It is probable that imports would supply about 25 percent (the average ratio of imports to consumption in the 5 biennial census years 1931-39). Imports may be about 400,000 dozen pairs, with a total foreign value of about 1 million dollars at 1939 prices. Production might be about 1.2 million dozen pairs, valued at nearly 3 million dollars (at 1939 prices). While slightly below the 1939 level, such an output would exceed in both quantity and value that in any census year from 1929 to 1937, inclusive.

Duty reduced by 50 percent.—Consumption probably would be increased somewhat, to 1.7 million dozen pairs (7 percent above 1939). Imports might increase to as much as 800,000 dozen pairs or 45 percent of consumption, and might have a foreign value of approximately 2.0 million dollars. Domestic production would probably be about 900,000 dozen pairs valued at about 2 million dollars.

Duty increased by 50 percent.—Consumption might be about 1.4 million dozen pairs. Imports would probably be below the 1939 level, possibly totaling 200,000 dozen pairs, or about 15 percent of consumption. The increase in the specific rate of duty would tend to exclude low-priced goods, and very high-priced hosiery would also be difficult to import because of the increased ad valorem rate. The total foreign value of imports might be in the neighborhood of \$700,000. Production would probably be near the 1939 level, or about 1.2 million dozen pairs; with a slightly higher average unit value, the total value then would be about 3 million dollars.

Per capita income 75 percent higher than in 1939.

The percentage increase of imports would possibly be greater than that of total consumption because of the increased demand for luxury qualities of wool hosiery, which, in the past, have largely been supplied by imports. Imports might be from 50 to 150 percent greater than at the lower level of income depending on the rate of duty.

Duty as in 1939.—Consumption of wool hosiery might rise to about 2 million dozen pairs or to more than 25 percent above the 1939 level. This would still be less than 0.2 pairs per person, compared with a probable per capita consumption of more than 15 pairs of hosiery of all kinds. Imports might be as much as 600,000 dozen pairs or about 30 percent of consumption. The foreign value of imports might be about 2 million dollars. Production would probably be about 1.4 million dozen pairs, with a value of about 3.9 million dollars.

Duty reduced by 50 percent.—Consumption might increase because of larger imports of low-priced hosiery to about 2.2 million dozen pairs. Imports would probably be greatly increased, perhaps even to 1 million dozen pairs (about 45 percent of consumption), with a foreign value of probably 3.0 million dollars. Although total consumption would probably be increased by the entry of some low-priced goods, domestic production would probably not exceed 1.2 million dozen pairs, with a value of about 3.1 million dollars.

Duty increased by 50 percent.—Consumption might be about 2 million dozen pairs, or about 25 percent more than in 1939. Imports might be about 15 percent smaller than if there were no change in duty. At the high level of income there might continue to be a considerable market for the better grades of foreign hosiery, possibly amounting to 500,000 dozen pairs (25 percent of consumption) with a foreign value of about 2 million dollars. Cheap qualities would probably be excluded by the high specific duty. Domestic production might increase to 1.5 million dozen pairs, with a value of perhaps 4.5 million dollars.

Exports

Exports are expected to remain negligible.

Employment

Production of wool hosiery gave employment to about 700 persons in 1939. Employment in the post-war long term may range from 550 at the lower assumed income level to 750 at the higher assumed income level.

WOOL KNIT OUTERWEAR

Tariff paragraph: 1114 (d)

Commodity: Outerwear and other articles not specially provided for, knit or crocheted, wholly or in chief value of wool (not including gloves and mittens nor embroidered outerwear covered by par. 1529 (a)).

Rates of duty: Various; 44¢ or 50¢ per lb + 25% to 75% ad val.

Equivalent ad valorem (1939): 46% (average).

NOTE.—The specific rates of duty (44 cents or 50 cents per pound) are intended to be compensatory for the duty on raw wool, and have remained the same since their enactment in the Tariff Act of 1930. Any change in the specific rates would presumably be accompanied by a corresponding change in the duties on raw wool, and would not affect the protection afforded domestic manufacturers. The following changes have occurred since 1930 in the ad valorem rates of duty:

The rate on headwear, not in part of wool felt, valued at not more than \$3 per pound was reduced from 45 percent to 30 percent in the trade agreement with France, effective June 15, 1933.

The rate on infants' outerwear, valued at more than \$3 per pound was reduced from 50 percent to 35 percent for that of Jersey fabric knit in plain stitch on a circular machine, and increased from 50 percent to 75 percent for other types, by Presidential proclamation effective July 11, 1932, under section 336 of the Tariff Act of 1930. Except as applied to headwear, the 75 percent rate was reduced to 50 percent in the trade agreement with the United Kingdom, effective January 1, 1939.

The rate on articles other than headwear and infants' wear was reduced from 50 percent to 40 percent for those valued at more than \$2 but not more than \$5 per pound and from 50 percent to 30 percent for those valued at more than \$5 per pound, in the trade agreement with the United Kingdom, effective January 1, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 40,000	1 207	1 39,793	288	1 40,081	Percent 0.7
Value (\$1,000).....	1 80,000	1 414	1 79,586	1 1,132		
Unit value (per pound).....	1 \$2.00	1 \$2.00	1 \$2.00	\$3.92		
Persons employed (number).....	1 20,000					

¹ Estimated.

² Includes all exports of wool knit goods but is believed to be chiefly wool knit outerwear.

³ Foreign value.

Paragraph 1114 (d) covers all types of wool knit or crocheted articles not ornamented, except gloves, hosiery, fabric, and underwear. For practical purposes, the articles consist entirely of wool knit outerwear, not embroidered.

The materials used in wool knit outerwear include a wide range of woollen, worsted and hair yarns and yarn mixtures such as wool-and-cotton and wool-and-rayon. Cashmere, the hair of the Cashmere goat, is used in high-priced garments and Angora rabbit hair is used in women's and infants' garments and for trimmings.

Sweaters constitute from 50 to nearly 70 percent of the total value of knit outerwear production and probably an equal or larger share of imports. Usually only the better grades of foreign wool knit outerwear have been imported into the United States in appreciable

quantities. The exceptions in a number of years have been headwear and some hand-crocheted baby garments.

The United Kingdom is the principal source of imports, supplying 78 percent of the total value in 1939. The imports from that country consist largely of standard types of garments in expensive qualities, distinctive for careful finish and unusual color ranges. They had an average foreign value of \$6.50 per pound in 1939. Much of the remaining imports in the 10 years 1930-39 consisted of headwear from France and Czechoslovakia, the average foreign value of which was only about \$1 per pound.

Imports were large during the first several years of the depression because berets of the basque type, for which the special machinery was not available in the United States, became popular and were imported in large quantities, especially from 1930 to 1933. In 1934, when this vogue diminished, total imports were 394,000 pounds with a foreign value of \$1,086,000, or 20 percent less in quantity and 58 percent less in value than in 1929. Imports in 1936-37 averaged 470,000 pounds with a foreign value of 1.6 million dollars, but declined in 1938-39 to only about 275,000 pounds with a foreign value of 1.1 million dollars.

The effect of changes in business conditions on production, like that on imports, was largely offset by fashion changes during the depression, the principal factor in this instance being the vogue for knitted dresses and suits, the demand for which was particularly strong in the years 1931-35. Compared with an estimated 39 million pounds, valued at 114 million dollars, in 1929, estimated production in 1935 was 44 million pounds, valued at 90 million dollars, and, in the census years 1937-39, averaged about 40 million pounds with a value of 80 million dollars. The decrease in 1937 and 1939 was due to both the decline of the fashion for knitted dresses and suits and the increasing manufacture of bathing suits from woven instead of knitted fabrics.

POST-WAR SHORT TERM

As is expected to be the case with most textiles, the demand for wool knit outerwear in the years immediately after the war will probably tax production facilities. Although knitting equipment itself may not be operated at capacity, a limit to the expansion of production will probably occur in the supply of yarns. Imports may be large if foreign producers, particularly in the United Kingdom, are able to export on a considerable scale.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

As the result of population increase, consumption might be about 10 percent greater than in 1939, say, 44-46 million pounds, depending somewhat on the rate of duty and the quantity of imports. Production probably would be about the same as consumption, or about 44 million pounds, the quantity remaining approximately the same under the different assumptions as to duty.

Duty as in 1939.—Production and imports might each be about 10 percent greater in quantity than 1939, with prices about the same as in that year. The value of production then would be about 90 million

dollars a year, and imports would represent about 0.7 percent of consumption in the United States, or 320,000 pounds, with a foreign value of about \$1,250,000 a year.

Duty reduced by 50 percent.—Because of the lower price of raw wool, which would result from the reduction in the duty on that material, the average value of wool knit outerwear manufactured in the United States probably would be reduced and as a result, the total value of production might be 80 million dollars a year, or somewhat less than with no change in the duties. Imports probably would still be largely confined to specialties and articles of which the average foreign value was considerably greater than the average value of production in the United States. The imports of moderately priced articles, however, might be considerably greater than if the duty were unchanged, so that the average value of imports would be reduced and the total quantity increased. The average foreign value might be about 15 percent less than with duty as in 1939, and the quantity of imports might increase to about 1.6 million pounds a year. Imports would then supply about 3 percent of consumption and have a foreign value of about 5.4 million dollars a year.

Duty increased by 50 percent.—Because of the higher price of raw wool, which would result from the increased duty on that material, the average value of wool knit outerwear produced in the United States might be increased and the total value of production be 100 million dollars a year or somewhat greater than with no change in the duties. Imports would continue to be limited still more than with the duty as in 1939, to expensive articles and specialties. They might be about 50 percent less in quantity and 35 percent less in value than if the duty were unchanged. They would then represent about one-third of 1 percent of consumption in the United States, and would be 155,000 pounds with a foreign value of \$800,000 a year.

Per capita income 75 percent higher than in 1939.

As a result of higher prices in general, and higher prices for raw wool in particular, the average value of production and imports might be 20 percent greater under each of the three assumed rates of duty, than was estimated previously with per capita income the same as in 1939. Consumption would possibly be 10 percent greater in quantity than if the income were unchanged, say, 48.5–51.5 million pounds a year, depending on the rate of duty and the quantity of imports. Production, which consists chiefly of staple articles, might be about 10 percent greater in quantity than at the lower income level, and might total 48.4 million pounds a year, the quantity remaining about the same under each of the three assumptions as to duty. The imports possibly would be twice as great in quantity under each of the three rates of duty as at the 1939 rate of income, because of the greatly increased demand for luxuries and specialties. On the basis of the foregoing considerations, the following estimates are derived in the same manner as those given previously with per capita income the same as in 1939.

Duty as in 1939.—The value of production might be 115 million dollars a year. Imports possibly would amount to slightly over 1 percent of consumption and would be 635,000 pounds with a foreign value of 3 million dollars a year.

Duty reduced by 50 percent.—Because of lower prices which would result from reduction of the duties (particularly on raw wool) the value

of production might be 105 million dollars a year, or somewhat less than if the duty were unchanged. Imports possibly would amount to about 6 percent of consumption and be in the neighborhood of 3 million pounds, with a foreign value of 12 million dollars a year.

Duty increased by 50 percent.—Because of higher prices which would result from the increased duties (particularly on raw wool) the value of production might be 125 million dollars a year or somewhat greater than if the duty were unchanged. Imports would possibly amount to about two-thirds of 1 percent of consumption, and would possibly be in the neighborhood of 300,000 pounds, with a foreign value of 2 million dollars a year.

Exports

Exports have been small in comparison with production, and have gone chiefly to countries in North and South America and the Caribbean area. Of the total value of exports in 1939, 49 percent consisted of bathing suits.

Exports probably will remain small (say, 200,000 pounds, valued at \$400,000–\$500,000 a year) regardless of foreign trade policies or the level of per capita income in the United States.

Employment

In the post-war long term, the number employed might be about 10 percent greater than in 1939, or 22,000 persons, with per capita income as in 1939, and about 20 percent greater, or 24,000 persons, with per capita income 75 percent greater.

WOOL WEARING APPAREL

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1115 _a (a)-----	Wool wearing apparel, not knit or crocheted:		
	Valued at not more than \$4 per lb.	33¢ per lb. + 30% ad val.	45%.
	Valued at more than \$4 per lb.	50¢ per lb. + 30% ad val.	39%.
	Average-----		43%.

NOTE.—The ad valorem portion of the rates as fixed in the Tariff Act of 1930 were 45 and 30 percent on the respective brackets shown above. They were reduced to 30 percent, effective January 1, 1939, pursuant to the United Kingdom trade agreement. The specific rate has not been changed.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production †			Imports	Appar-ent con-sumption	Ratio of imports to con-sumption
	Total	For ex-port	For do-mestic market			
Quantity (1,000 pounds)-----	(?)	(?)	(?)	486		Percent
Value (million dollars)-----	900	0.8	890	\$ 1.9	904	0.2
Unit value (per pound)-----	(?)	(?)		\$2.74		
Persons employed (number)-----	200,000-225,000					

† Estimated factory production.

‡ Not available.

§ Landed value; foreign value was \$1,300,000.

* Foreign value.

Although statistics of wool wearing apparel are not separately reported, factory production may be estimated from the production of articles known to consist principally of wool, of which the chief ones are men's and boys' and women's and misses' suits and coats, the combined value of which is probably about 85 percent of the total. The total value of production, estimated on this basis, declined from 1,600 million dollars in 1923 to 1,400 million in 1929 and to 660 million in 1933; later it rose to 950 million in 1937, and was 900 million in 1939. During the same period (1923-1939) the estimated value averaged approximately 1.5 to 1.8 percent of national income, falling gradually from a high of over 2 percent in 1923 to barely over 1¼ percent in 1939. The steady decline can probably be attributed to competition of other fibers as well as to more diversified products attracting the consumer dollar.

Wool wearing apparel has never been an important commodity in international commerce. One factor retarding foreign trade has been the element of style, which in the past has made importing a difficult as well as a hazardous business. Moreover, in no other country has the factory production of wool garments reached such enormous proportions as in the United States. In most foreign countries wool garments are still made chiefly by the custom tailor or in the home, and consequently are not products for international trade.

Because they partake of a luxury character, imports into the United States have undergone relatively sharp fluctuations with changes in business conditions. They amounted to 4 million dollars (foreign value) in 1929, declined to \$700,000 in 1932, and then increased steadily to 2.5 million dollars in 1937, after which the trend was downward. Imports have represented only a fraction of 1 percent of consumption, and have consisted principally of men's and boys' English overcoats, most of which were imported to sell at prices greater than the average for men's and boys' overcoats produced in this country. Articles of lesser importance include topcoats, raincoats, mufflers, riding breeches, hunting coats, neckties, and apparel for evening wear.

POST-WAR SHORT TERM

The needs of returning soldiers, together with an expected increase in civilian demand will probably result in a much larger consumption of wool wearing apparel. When account is taken of the probable increase in prices, the value of production may be much greater than in 1939. Imports will probably remain relatively small, as heretofore.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—As the result of population increase the total consumption of wool wearing apparel might be about 10 percent greater than in 1939, or in the neighborhood of 1 billion dollars a year. It is assumed that a proportionate increase would occur in both production and imports, in which case production would be approximately the same as consumption, and imports would be a very small part of the total, say, half a million pounds with a foreign value of 1.4 million dollars a year.

Duty reduced by 50 percent.—The lower price of raw wool, upon which the duty would also be reduced, might cause the price of wool fabrics to be reduced 15–20 percent. This probably would be accompanied by a reduction in the price of apparel, for which wool fabric represents from one-fourth to one-half of the total cost. Not all of the saving that resulted, however, would occur in the form of lower prices, as a better average quality of fabric would be used. The average cost of wool fabric possibly would be 10–15 percent less, and the average value of wool apparel 4–7 percent less than if the duty were unchanged. The reduction in average value might be accompanied by an increase in the quantity of consumption, so that the total value of production possibly would remain about the same as if the duties were unchanged or in the neighborhood of 1 billion dollars a year. Although imports would be greater than under the existing duty they probably would continue to represent a negligible proportion of consumption. They might be 750,000 to 1 million pounds, with a foreign value of 1.9–2.5 million dollars a year.

Duty increased by 50 percent.—Because of the higher price of raw wool which would result from the increased duty on that material, the average price of wool fabrics might be 10–15 percent greater, and the price of wool apparel 4–7 percent greater than under the existing rates of duty. In this case, as with the duties reduced 50 percent, the change in price might be approximately offset by the change in the quantity of consumption, so that the value of consumption (and production) would remain about the same as if the duties were unchanged, or in the neighborhood of 1 billion dollars a year. Imports, to an even greater extent than in the past, probably would be restricted to specialties and luxuries of a high average value. The amount received might be approximately 300,000 pounds, with a foreign value of \$925,000 a year.

Per capita income 75 percent higher than in 1939.

As the result of a higher general price level, and a considerably higher price for raw wool, the average unit value of both production and imports might be about 20 percent greater, under each of the assumptions as to duty, than if per capita income were the same as in 1939. The quantity of consumption (and the production) of wool clothing possibly would also be about 20 percent greater, in each case, than at the lower level of per capita income. The increase in imports would be much greater than in production, because of the relatively great increase in the demand for high-priced articles and luxuries; the quantity received possibly would be two to three times as great, depending on the rate of duty, as was estimated at the lower level of per capita income. Imports, however, would still represent a very small proportion (barely over one-half of 1 percent at the most) of the total quantity of consumption.

Under the conditions stated, the value of production and consumption would be relatively constant between 1.4–1.5 billion dollars a year, the difference in price which would occur under different levels of duty being approximately offset (as with per capita income the same as in 1939) by changes in quantity. The imports which would follow from the conditions stated are given below.

Duty as in 1939.—Imports might be 1.2 million pounds, with a foreign value of 4.7 million dollars.

Duty reduced by 50 percent.—Imports might be 1.75 million pounds, with a foreign value of 5.25 million dollars.

Duty increased by 50 percent.—Imports might be about 0.9 million pounds, with a foreign value of 3.25 million dollars.

Exports

Exports from the United States are small in comparison with production. They have been principally to Canada, Central and South American countries, and the Union of South Africa. Exports probably will remain small in relation to production, although for the first few years after the war they may be considerably greater than in 1939, because of the large accumulated demand abroad. In the long term they might be about the same as in the pre-war years, or about \$600,000 to \$1,000,000 a year.

Employment

It is estimated that employment in the post-war long term, with no change in national income, will be about 5 to 10 percent higher than in 1939, or about 210,000 to 245,000 persons, and with national income increased 75 percent, may be about 15 to 20 percent higher, or about 230,000 to 270,000 persons.

WOOL-FELT HAT BODIES

Tariff paragraph: 1115 (b).

Commodity: Wool-felt hat bodies not blocked, trimmed, or finished.

Rate of duty: 40¢ per lb. and 55% ad valorem. *Equivalent ad valorem (1939):* 106% valorem.

NOTE.—The rate fixed in the Tariff Act of 1930 was 40 cents per pound plus 75 percent ad valorem. The specific rate of duty (40 cents per pound) is intended as compensatory for the duty on raw wool and wool tops. A change in the specific rate, which was accompanied by a corresponding change in the duty on these materials, would not alter the protection afforded to manufacturers. The rate in the act of 1930 was reduced to 40 cents plus 55 percent, effective April 15, 1931, by Presidential proclamation under section 302 of the tariff act.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production †		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For domestic market ‡			
Quantity (1,000 doz.)	2,821	2,821	657	3,478	Percent
Value (\$1,000)	9,932	9,932	1,797		10
Unit value (per dozen)	\$3.52	\$3.52	\$2.73		
Persons employed (number)	2,630				

† Women's and children's hat bodies carded for sale as such.
 ‡ Exports were negligible.
 § Foreign value.
 ¶ Estimated.

Wool-felt hat bodies are made of wool noils with, usually, an admixture of new wool of longer staple to give strength and stiffness. The body is first formed at the card. The carded bodies are hardened, fulled, twisted, dyed, and blocked for sale as hat bodies, or are subjected to additional processes, mainly sandpapering, buffing, and shaping, with or without ornamentation, for sale as hats. Bodies for men's hats are usually finished into hats at the mill, whereas most of the bodies for women's hats are sold to separate hat-finishing establishments. Of a total of 3,565,000 dozen hat bodies carded in the United States in 1939, 3,076,000 dozen were sold as hat bodies; of these latter 255,000 dozen were for finishing into men's hats and 2,821,000 dozen for finishing into women's hats. Imports of wool-felt hat bodies are confined almost exclusively to those for finishing into women's hats.

The total supply (production plus imports) of women's wool-felt hat bodies for sale declined from 3.9 million dozen in 1929 to 1.6 million dozen in 1933, but later recovered and was about 3.5 million dozen in 1937-39. Production, imports, and consumption in specified years 1929 to 1939 are shown below:

Year	Production	Imports	Apparent consumption	Ratio of imports to consumption
	<i>Dozens</i>	<i>Dozens</i>	<i>Dozens</i>	<i>Percent</i>
1929	500,516	3,282,524	3,282,132	87
1931	709,370	1,404,189	2,172,559	65
1933	593,850	940,936	1,532,786	62
1935	1,641,065	1,370,919	3,012,984	45
1937	2,132,265	1,456,147	3,611,403	40
1939	2,821,000	647,006	3,468,106	19

¹ For women's and children's hats only.

In 1929 imports represented 87 percent of the total supply, but domestic production had already been increasing. It continued to increase until, in 1937, imports represented only 40 percent and production 60 percent of the total supply. In 1939, partly as the result of the preparations for war in Europe, imports were only one-half as great as in 1937, and domestic production accounted for about 80 percent of the total. Most of the imports have generally come from Italy, but Japan became the principal source in 1937 and again in 1940 and 1941.

Women's finished wool-felt hats retail in the United States from about 90 cents to \$3.50 each, depending upon the weight (size), grade, finish, and amount of trimming. Women's felt hats, sold above \$3.50 each, are usually of the fur-felt variety.

Domestic producers, because of proximity to the market, are in a position to more readily adapt their production to the frequent style changes, especially in regard to color. Imports are largely staple colors such as black, navy blue, brown, and green.

In the trade agreement with the United Kingdom, effective January 1, 1939, the duty on carbonized and upcarbonized noils was reduced from 30 and 23 cents per pound to 21 and 16 cents per pound, respectively. This was to the advantage of the domestic producers of hat bodies for which noils constitute the principal raw material.

Estimates of post-war consumption, production, and imports are given in the sections which follow. For the purpose of these estimates,

it is assumed that the fashion for wool-felt hats will be about as in 1939. As fashion is largely unpredictable, however, the estimates made on this basis are subject to a large possible error.

POST-WAR SHORT TERM

Consumption of women's wool-felt hats in the immediate post-war period may be at about the 1939 level or in the neighborhood of 3½ million dozen a year. The volume of imports will largely depend on whether Italy is in a position to export hat bodies.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—As the result of population increase, consumption might be about 10 percent greater than in 1939, or 4 million dozen. The proportion supplied by imports in 1939 was unusually low. The proportion in 1937 is, therefore, taken as more representative. Taking into account the downward trend of the proportion of consumption supplied by imports, they might be about 35 percent of the total, or 1.4 million dozen, and production in the United States would account for the remainder, or 2.6 million dozen. Assuming that the average value of production and imports would be the same as in 1939, the total value of production would then be 9.2 million dollars and that of imports 1.7 million dollars (foreign value).

Duty reduced by 50 percent.—The lower duty on raw wool and noils would probably decrease the price of domestic bodies about 20 cents a pound, or in the neighborhood of 40 cents a dozen, and a further reduction of 15 or 20 cents a dozen might occur from the increased competition of imported hat bodies. As a result of lower prices, consumption might be 10 or 12 percent more than if there had been no change in the duty, or about 4.5 million dozen. Of this amount imports might supply 45 percent, or 2 million dozen, with a foreign value of 2.5 million dollars. Production then would be about 5 percent less in quantity than if the duty had been unchanged, and would amount to 2.5 million dozen, valued at 7.3 million dollars.

Duty increased by 50 percent.—Because of higher prices for both domestic and imported wool-felt hat bodies, consumption would probably decline to about 3.5 million dozen. Imports would be severely reduced and might be 10 percent of consumption or 350,000 dozen with a foreign value of \$480,000. The higher duty on noils and raw wool would probably increase the cost of hat bodies produced in this country about 40 cents a dozen, and a further increase of 15 or 20 cents a dozen in the price might result from the reduced competition of imported hat bodies. The estimated quantity of production, 3,150,000 dozen, then would have an average value of about \$4.10 per dozen, and a total value of \$12,700,000.

Per capita income 75 percent higher than in 1939.

Although a number of women who had been accustomed to wearing wool-felt hats probably would adopt the more expensive fur-felt hats, others would probably buy a larger number of wool-felt hats in a variety of styles and colors, so that consumption of these might be 25 percent greater than if per capita income had been the same as

in 1939. The same percentage of increase presumably would occur in the quantity of both production and imports. The average unit value of production and imports might be about 10 to 15 percent greater than at the lower level of per capita income.

Duty as in 1939.—Consumption might be about 5 million dozen, of which production in the United States possibly would supply 3½ million dozen, valued at 13 million dollars, and imports would supply 1½ million dozen, or 35 percent of consumption, with a foreign value of 2.5 million dollars.

Duty reduced by 50 percent.—Consumption might be about 5½ million dozen, of which 3 million valued at 10.1 million dollars would possibly be supplied by production in the United States, and 45 percent of consumption, or 2.5 million dozen, with a foreign value of 3.5 million dollars, would be supplied by imports.

Duty increased by 50 percent.—Consumption might be about 4.5 million dozen, of which 4 million with a value of 18.8 million dollars would possibly be supplied by production in the United States, and 450,000 dozen, or 10 percent of consumption, with a foreign value of \$630,000 would be supplied by imports.

Exports

Exports will probably remain negligible.

Employment

At the same level of duty as in 1939, employment after the war, on a long-term basis, might be about 2,500 persons if per capita income remains the same as in 1939, and about 3,300 persons if per capita income is 75 percent greater than in 1939.

ORIENTAL RUGS

Tariff paragraph: 1116 (a).

Commodity: Oriental and similar hand-made carpets and rugs.

Rate of duty: 30¢ per sq. ft. but not less than 45% ad val. *Equivalent ad valorem (1939):* 60%.

NOTE.—The Tariff Act of 1930 rate was 50 cents per square foot but not less than 45 percent ad valorem. Certain of these rugs were dutiable at 90 percent ad valorem prior to June 26, 1933, but on and after that date they became subject to the 50 cent per square foot (45 percent minimum) rate. The duty was reduced to 30 cents per square foot (45 percent minimum), effective May 3, 1939, pursuant to the Turkish trade agreement; a further reduction in the duty to 25 cents per square foot, but not less than 22½ percent ad valorem was made pursuant to the trade agreement with Iran, effective June 26, 1944.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 square yards).....	361
Value (\$1,000).....	1 2, 577
Unit value (per square yard).....	\$7. 14

¹ Foreign value.

Hand-made carpets and rugs are not produced on a commercial scale in the United States. Such floor coverings include the oriental or hand-made knotted-pile rugs and, to a less extent, European hand-tufted carpetings of wool or other material. Iran and China are the principal suppliers. After 1930, the introduction of washed rugs of domestic manufacture (so-called American orientals), together with

higher duties and the depression, resulted in a severe decline in imports. Average annual imports in the decade 1931-40 were less than one-third the quantity imported annually in the period 1921-30.

Imports compete only indirectly with domestic machine-made carpets and rugs, the gross sales of which in 1939 were 62 million square yards valued at 149 million dollars. Their most nearly direct competition is with the domestic machine-made sheen type rugs, United States production of which amounted to 1.5 million square yards in 1939.

United States production of wool carpets and rugs during the war has been about 25 percent of normal as the industry has been engaged in the manufacture of wool blankets, cotton duck, and other war materials for the Government.

POST-WAR SHORT TERM

The production of wool carpets and rugs in the United States will not be restored to its pre-war rate for some time after the close of hostilities because of the interval which must elapse before the looms can be put into condition for weaving carpets, and because of the delay which will attend the acquisition of the necessary supplies of carpet wool from China and of carpet wool and jute from India. When production has been restored it will be several years more before the accumulated demand for wool floor coverings can be met. In this period, the amount of imports of oriental rugs will be governed largely by the supply available abroad. Imports may be large, and might be as great as in the decade 1921-30 when they averaged over 2 million square yards a year. The foreign value may be considerably higher than in the 1920's and may be from 20-25 million dollars per year.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—With the duty at 30 cents per square foot but not less than 45 percent ad valorem, the per capita consumption would probably remain near the 1939 level. On this basis, imports would be 300,000-400,000 square yards and, assuming the same price as in 1939, have a foreign value of 2½-3 million dollars.

Duty reduced by 50 percent.—At this rate of duty, rugs valued at not more than 66½ cents per square foot would be dutiable at 15 cents per square foot and those valued at more than 66½ cents would be dutiable at 22½ percent ad valorem. At these rates there might be an increase in the importation of medium- and low-grade rugs which are more competitive than are the higher grade oriental rugs with the better grades of machine-made rugs produced in this country. Imports might be much greater than in 1939 and amount possibly to from 1-2 million square yards with a foreign value of from 7-14 million dollars per year.

Duty increased by 50 percent.—With a duty of 45 cents per square foot but not less than 67½ percent ad valorem, imports would tend to decline and be largely confined to oriental rugs of the higher grade. Rugs valued at not more than 66½ cents per square foot would be dutiable at 45 cents per square foot. This would probably

result in a considerable decline in the importation of medium- and low-grade rugs. Total imports would possibly amount to from 200,000-300,000 square yards with a foreign value of from 2-4 million dollars.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Because of the prestige attached to oriental rugs and their status as a luxury, a very great increase in sales probably would occur. Imports might be four or five times as great as in 1939, and amount to as much as, say, 1-2 million square yards. It is probable also that there would be a demand for the finer qualities which might increase the foreign value per square yard to \$10, compared with \$7.13 in 1939 and bring the foreign value of imports up to 10-20 million dollars.

Duty reduced by 50 percent.—A duty of 15 cents per square foot but not less than 22½ percent ad valorem would enlarge the market for oriental rugs. While they would remain in the luxury class, they would be distributed in considerable quantities to the great number of middle class consumers. Imports would doubtless be considerably higher than at the 1939 duty and might be as large as 2-4 million square yards, with a foreign value of from 15-30 million dollars per year.

Duty increased by 50 percent.—A duty of 45 cents per square foot but not less than 67½ percent ad valorem would tend to confine imports to the better qualities. This circumstance, in turn, might result in a smaller per capita consumption of oriental rugs, and imports might be from 600,000-800,000 square yards with a foreign value of from 6-8 million dollars per year.

MACHINE-MADE WOOL CARPETS AND RUGS

Tariff paragraph: 1117.

Commodity: Machine-made wool
carpets and rugs.

Rate of duty: 25%, 30%, 40%, or 60% *Equivalent ad valorem (1939):* 35%
ad val.

NOTE.—Commodities covered by this report were dutiable under the Tariff Act of 1930 at 25, 30, 40, or 60 percent ad valorem. The rate on Axminster, Wilton, Brussels, velvet or tapestry, and carpets and rugs of like character, as well as on floor coverings of Angora goat hair, when valued at over 40 cents per square foot, was reduced from 60 to 40 percent, effective Jan. 1, 1939, pursuant to the trade agreement with the United Kingdom. Other rates were not changed.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 square yards).....	61,864	99	61,765	1,572	63,337	Percent ¹
Value (\$1,000).....	147,766	289	147,436	1,949		
Unit value (per square yard).....	\$2.39	\$2.83	\$2.39	\$1.23		
Persons employed (number).....	28,727					

¹ Foreign value.

Production of machine-made wool carpets and rugs in the United States is largely confined to the standard types of floor coverings such as Axminster, Wilton, and velvet. Imports have consisted mainly of wool druggets and Numdah (embroidered felt) rugs from British India and hooked rugs from China and Japan. Druggets and Numdah rugs are used principally in summer homes and bedrooms and are not produced in the United States.

Imports of rugs similar to those manufactured in this country come from Europe. The foreign carpet manufacturer does not go in for mass production, as does the American producer, with the result that certain stores are able to supply, in the imported article, specialties such as unusual colors and designs, which the foreign producer will make up for a very small order. The imported Wilton, velvet and similar floor coverings constitute only a fraction of 1 percent of United States consumption of machine-made wool carpets and rugs and sell on the American market at higher prices than the nearest comparable domestic article.

In the past, production in the United States has fluctuated widely. In 1923, after several years of unusual building activity, it reached a record of 83 million square yards, valued at 192 million dollars. It declined in 1933 to 42 million square yards, valued at 69 million dollars, then recovered in 1937 to 65 million square yards valued at 150 million dollars.

During the present war the domestic carpet and rug industry has been engaged principally in the production of wool blankets and cotton duck. It will require considerable time to reconvert the looms for weaving carpets. Furthermore, some delay may be experienced in obtaining the necessary supplies of carpet wool and jute, for which the industry is wholly dependent upon foreign sources, the carpet wool being obtained mainly from India, China, and Argentina and the jute from India. It may be assumed, therefore, that full production cannot be resumed for from 6 months to a year after the close of hostilities.

Unlike the principal raw materials used in other products of wool, most of those used in the manufacture of carpets and rugs (carpet wool and jute) are imported into the United States free of duty. No significant change in raw material costs of rugs and carpets, therefore, would occur with an increase or decrease of 50 percent in the duties.

POST-WAR SHORT TERM

Before the end of the war stocks in the United States of wool carpets and rugs will have been exhausted and in the immediate post-war period most homes will have actual need of a considerable amount for replacement. In addition, there will be large requirements for outfitting new homes, particularly for those who married during the war but did not set-up housekeeping.

Under these conditions it may be expected that the industry will operate at capacity for several years after the close of hostilities. Production may reach 100-125 million square yards annually, valued at 270-330 million dollars. It is probable that imports will be somewhat less than in 1939 because of the length of time which will probably be required to restore European production to its pre-war basis and permit foreign countries to replenish supplies which have become depleted.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

As the result of population growth, consumption probably would be about 10 percent greater than in 1939, or around 70 million square yards a year. Of this amount 66-69 million square yards probably would be supplied by production in the United States, depending partly on the assumed rate of duty. The unit value of production might be about the same as in 1939, or \$2.30 to \$2.40 per square yard and the total value then would be 150-165 million dollars. Consumption probably would not be altered to any great extent by a decrease or an increase of 50 percent in the duties.

Duty as in 1939.—Imports might be in the neighborhood of 1½ million square yards, with a foreign value of 2½ million dollars, and might represent about 3 percent of consumption.

Duty reduced by 50 percent.—A duty of 20 percent ad valorem on Axminster wool rugs, Wilton, velvet, etc., 15 and 20 percent on mohair rugs, and 15 and 30 percent on all other floor coverings including mats and druggets might cause imports to increase until they were in the neighborhood of 3½ million square yards with a foreign value of 5 million dollars. The imports then would represent about 5 percent of domestic consumption.

Duty increased by 50 percent.—It is probable that imports from Europe would practically cease and imports would be limited largely to India druggets and Numdah rugs, and hooked rugs from China and Japan. Total imports might amount to about 2 percent of consumption or 1-1½ million square yards, with a foreign value of 1.1-1.7 million dollars.

Per capita income 75 percent higher than in 1939.

The consumption of carpets and rugs would increase materially under a high national income and might be 90-100 million square yards a year, or 40-60 percent greater than in 1939. Production then might be 90-93 million square yards and would represent, as before, from 95-98 percent of the total supply.

The value of production probably would increase more, in comparison with 1939, than the quantity, as the result both of higher prices and higher average quality. The unit value of production might be \$2.80 or \$2.90 a square yard, and average 20 percent greater than in 1939. The total value of production then would be 250-270 million dollars.

Duty as in 1939.—Imports might be in the neighborhood of 2½ million square yards, valued at 4 million dollars, and supply between 2 and 3 percent of the total consumption as in the past.

Duty reduced by 50 percent.—Imports might be 4½-5 million square yards, valued at 7½-8½ million dollars, and supply about 5 percent of the consumption of carpets and rugs in the United States.

Duty increased by 50 percent.—A duty of 60 percent ad valorem, to which most rugs from Europe would be subject, would virtually close the market to imports from that source. The duty of 45 percent ad valorem which would apply to the comparatively low-priced floor coverings from India, China, and Japan might result in imports of 1½-2 million square yards, valued at 2-2½ million dollars, and supply only about 1-2 percent of consumption.

Exports

Exports of wool carpets and rugs have been only a small fraction of the amount of imports, and have been insignificant in relation to production in the United States. The principal foreign markets have been Mexico, Canada, and other countries in the Americas. After the war exports probably will continue to be small.

Employment

The average number of wage earners in the United States wool carpet and rug industry declined from 29,000 in 1939 to about 20,000 in 1944. In the immediate post-war period employment will be high and should be substantially above the level of 1939. On a long-term basis, employment may be 10-50 percent higher than in 1939, depending principally on the assumptions made with regard to per capita income.

MIXED FABRICS

Tariff paragraph: 1122.

Commodity: Fabrics (except printing-machine cylinder lapping in chief value of flax), containing 17 per centum or more in weight of wool, but not in chief value thereof.

Rate of duty: Various. *Equivalent ad valorem (1939):* 52%.

GENERAL

Data on United States imports for 1939 are given below:

Quantity (1,000 pounds)-----	108
Value (\$1,000)-----	116
Unit value (per pound)-----	\$1.07

¹ Foreign value.

Paragraph 1122 covers both flat and pile-woven fabrics containing 17 percent or more in weight of wool but in which wool is not the material of chief value. Among the fabrics falling under the general provisions of this paragraph are cotton-and-wool-mixed suitings, trouserings, pajama flannels, and pile fabrics, in chief value of cotton. Cloths containing 17 percent or more in weight of wool but in chief value of flax (except those specifically excluded), hemp, ramie, silk, rayon, etc., either flat or pile-woven, are also dutiable under paragraph 1122. The United Kingdom has been the principal source of imports, followed by Switzerland, France, and Italy.

Fabrics of this character are produced in both the cotton and wool manufacturing industries. Production is not separately recorded, but is probably large as compared with imports. Exports are not separately recorded but are known to be negligible.

POST-WAR SHORT TERM

There will probably be an active demand for both apparel and upholstery mixed fabrics in the immediate post-war period. Because of conditions in the supplying countries, imports probably will be small.

POST-WAR LONG TERM

Per capita income at 1939 level.

Duty as in 1939.—As the result of population increase, total consumption and import might be 10 percent greater than in 1939. Imports might be about 120,000 pounds, with a foreign value of \$130,000.

Duty reduced by 50 percent.—Imports might increase 50 percent over the 1939 level or to 160,000 pounds with a foreign value of \$175,000.

Duty increased by 50 percent.—It is probable that imports would fall to about one-half the value entered in 1939 and would be confined to higher grade upholstery cloths. They might be in the neighborhood of 50,000 pounds, with a foreign value of \$80,000.

Per capita income 75 percent higher than in 1939.

The quantity of imports might be 25 percent greater and the value 40 percent greater than if per capita income had remained as in 1939. The estimates which follow are obtained by applying these ratios of increase to the estimates already made for the lower income level.

Duty as in 1939.—Imports might be about 150,000 pounds, with a foreign value of \$175,000.

Duty reduced by 50 percent.—Imports might rise to 200,000 pounds, with a foreign value of \$245,000.

Duty increased by 50 percent.—Imports might be 40 percent less than in 1939, or 65,000 pounds. The higher duty would tend to confine imports to the better grade of cloth. As a result, the average foreign value might be as much as \$1.80 per pound and the total foreign value, \$112,000.

SCHEDULE 12. SILK MANUFACTURES, AND RELATED ITEMS PROVIDED FOR IN THE FREE LIST

INTRODUCTION AND SUMMARY

Below are presented separate comments on each of the items covered by schedule 12 of the Tariff Act of 1930 which come within the scope of Senate Resolution 341. The only exception to this statement relates to the so-called basket clause, manufactures of silk, n. s. p. f.; imports of which were valued at \$171,000 in 1939. The many diverse articles covered by this basket clause are wholly unrelated and subject to different influences. It is thus impossible to make significant post-war estimates regarding them.

Under this schedule there are five groups of dutiable articles on which report is made. Imports of these articles in 1939 were valued at 4.9 million dollars, an amount which was 93 percent of the total value of all commodities imported under this schedule in 1939. Report is made also on three free-list items which are related to the dutiable items under schedule 12. The total value of the imports of these free-list items in 1939 was 113.3 million dollars.

Estimates of production (for the domestic market) and imports in the post-war long term of these dutiable and related duty-free articles have been totaled. (Where estimates of production and imports are not given in a single figure but in the form of a probable range, the middle point of the range has been taken for purposes of tabulation.) The following tabulation compares these total estimates with actual production (for the domestic market) and actual imports in 1939:

Period, income level, and tariff treatment	Production for the domestic market		Imports	
	Value	Ratio to 1939	Foreign value	Ratio to 1939
<i>Silk manufactures, dutiable</i>	<i>Million dollars</i>	<i>Percent</i>	<i>Million dollars</i>	<i>Percent</i>
1939	185.8	100	4.9	100
Post-war long term:				
Per capita national income same as 1939:				
Duty as in 1939	92.0	50	2.8	57
Duty reduced 50 percent	90.4	49	5.0	102
Duty increased 50 percent	92.6	50	1.5	30
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939	122.6	67	4.0	81
Duty reduced 50 percent	122.0	66	6.9	140
Duty increased 50 percent	124.2	67	2.8	56
<i>Silk and silk manufactures, free</i>				
1939	0	0	113.3	100
Post-war long term:				
Per capita national income same as 1939	0	0	19.4	17
Per capita national income 75 percent higher than in 1939	0	0	27.1	24

It should be emphasized that the foregoing estimates for production do not include production for export, although, as indicated in the general introduction, the sections on particular commodities discuss post-war export probabilities. It should also be emphasized that, as pointed out in the general introduction to this report, the estimates made, for individual articles, under the various assumptions in the resolution, are subject to considerable, frequently wide, margins of error. Because of the small number of items represented, not much reliance can be placed upon the tendency for errors to be in both directions and to offset each other. For this reason, the margin of error in the totals given above may be fairly large, possibly as much as 10 to 20 percent.

Taking the figures, as they stand, however, the estimates indicate that the value of the production of silk manufactures in the post-war period is likely to be between 45 and 70 percent of production in 1939, depending principally on the assumption as to national income. Imports of dutiable silk manufactures might be between 35 and 140 percent of 1939 imports, depending on the assumptions as to both duty and national income. Imports of duty-free items, the most important of which is raw silk, are likely to be only 15 to 25 percent of what they were in 1939 under either assumption as to national income.

These conclusions seem to be warranted by the fact that before the war rayon and other synthetic fibers, such as nylon, were replacing silk. The margin of error in the statistics is not sufficient to affect these conclusions materially.

SPUN-SILK YARN

Tariff paragraph: 1202.

Commodity: Spun silk or schappe silk yarn.

Rate of duty: 40 percent ad valorem (if not bleached, dyed, colored, or plied); 50 percent ad valorem (if bleached, dyed, colored, or plied). *Equivalent ad valorem (1939):* 48%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1,861	159	1,692	161	1,853	Percent 8.7
Value (\$1,000).....	4,040	653	3,387	158		
Unit value (per pound).....	\$2.15	\$3.45	\$2.00	\$0.95		
Persons employed (number).....	1,000					

¹ In addition, silk and rayon mixed yarns were spun on silk system amounting to 310,000 pounds, valued at \$453,000.

² Foreign value.

³ Estimated.

Spun silk, known in Europe as *schappe*, is yarn made from silk waste, ordinarily from unreelable cocoons and silk filature waste imported from Asia (see paragraph 1762). Because of the inherent nature of the silk fiber, the technique of spun-silk manufacture requires more numerous and complicated preparatory operations and more hand labor than the manufacture of cotton or wool yarns. Specialized types of machinery are required, which, however, employ basic principles common to usual picking, carding, combing, and spinning equipment.

Before the existing control of raw materials was adopted, spun-silk yarns were used principally for decorative effects in worsted fabrics, clockings in hosiery, novelty combination and mixture yarns, and ribbonzene tie bands for fancy packaging. Small quantities went into the manufacture of electrical insulation and seaming thread for the glove and underwear trades. During the war, military requirements have restricted the use of spun-silk yarn to the manufacture of cartridge cloth, stitching thread, and lacing cord for powder bags intended for large-caliber ordnance.

Although United States consumption and imports have varied considerably with fluctuations in the national income, demand has been influenced primarily by trends in style and by competition with the improved synthetic yarns. Since the early thirties, the spun-silk industry has been adversely affected by unfavorable styles, substitution and competition of continuous filament rayon yarn and spun rayon, and the high price of spun silk relative to that of raw silk. Purchases of spun-silk yarn by the textile industry declined from 6 million or 7 million pounds annually in the twenties to less than 2 million pounds in the period immediately preceding the war. The decline in consumption was greatest in the velvet and plush industry, formerly the chief user. During the twenties, changes in fashion served to outmode silk drapery velvets, furniture upholstery plushes, imitation fur-fabric coatings, and millinery velvets. Dress velvets with spun-silk pile were displaced by transparent rayon pile velvets.

Manufacturers of velvets, several of whom formerly produced spun-silk yarn for consumption in their own mills as well as for sale, also utilized a substantial proportion of imported yarns. Foreign yarns were, in fact, preferred because of their superior softness which was attained by a special technique employed abroad but not economically feasible in this country.

During the twenties, imports supplied between 20 and 30 percent of United States consumption and consisted almost wholly of ply yarns for the velvet-weaving industry. With the decline in demand for velvet yarns, which fell off more rapidly than domestic production, imports declined from 1,360,000 pounds in 1925 to an average of 46,000 pounds annually in the period from 1932 to 1936. They rose to 207,000 pounds in 1937 but constituted only about 10 percent of consumption in that year.

Before the war, imports of spun-silk yarn ordinarily came from France, Switzerland, Italy, the United Kingdom, and Japan. Over one-half the imports in 1938 and one-third those in 1939, however, consisted of low-cost bourette yarns invoiced from Belgium at 40 cents per pound. These yarns are made by woolen yarn spinners from

short-fibered silk noils discarded in the manufacture of spun-silk yarn. The increased shipments of such yarns accounts for the low average foreign value of 95 cents a pound for total imports in 1939. In making estimates of post-war trade, therefore, the more representative average value (\$1.30) is employed for imports of standard spun-silk yarn from the customary sources of supply.

POST-WAR SHORT TERM

It is probable that the demand for spun-silk yarns will continue to be small and will be limited principally by their use in the production of specialties. The supply of these yarns also will be restricted, as the spun-silk industry, both here and abroad, will probably encounter a shortage of raw materials pending restoration of the sericultural industry, especially in China, which was formerly the chief source of the preferred grades of waste.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The decline in the consumption of spun-silk yarns, apparent since the late twenties, is likely to be accelerated by an expansion in the use of spun rayon and the development of yarns from nylon staple fiber. Yarns spun from synthetic fibers will have a competitive advantage from the standpoint of costs, inasmuch as spun-silk production involves a much higher labor ratio. Consumption might be less than one-third that in 1939 and be between 550,000 and 600,000 pounds, depending partly on the assumption as to duty.

Duty as in 1939.—Imports of spun-silk yarns may be only about 50,000 pounds, representing 9 percent of consumption. Assuming that imports will consist principally of standard spun-silk yarn, valued abroad at approximately \$1.30 per pound, their foreign value might be about \$65,000. Domestic production would probably be about 600,000 pounds, with a value of 1.3 million dollars.

Duty reduced by 50 percent.—Imports might amount to about 100,000 pounds, and their foreign value might be in the neighborhood of \$130,000. About 17 percent of consumption then, would be supplied by imports. Production would be nearly 560,000 pounds, valued at 1.2 million dollars.

Duty increased by 50 percent.—A higher rate of duty might restrict imports to about 25,000 pounds. This quantity might have a value slightly over \$30,000 and represent about 4 percent of consumption. Production would then amount to about 645,000 pounds, valued at nearly 1.4 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of spun-silk yarns might be about 30 to 40 percent higher than estimated on the basis of the lower income level, or between 750,000 and 850,000 pounds, depending on the assumption as to duty. Because of the greater use of other fibers, however, United States requirements for spun-silk yarns would probably be less than one-half the volume consumed in 1939. With a probable increase in

the general price level, the unit values of the spun-silk yarns domestically produced as well as those imported may increase by nearly 15 percent over those in 1939.

Duty as in 1939.—Imports might be in the neighborhood of 60,000 pounds. With the higher unit prices which probably will obtain, the foreign value of such shipments might be about \$88,000. Imports might represent about 8 percent of the total quantity consumed domestically. Production would amount to about 800,000 pounds, with a value of about 1.9 million dollars.

Duty reduced by 50 percent.—Imports might possibly amount to 120,000 pounds. The foreign value would then be about \$175,000. At this level, slightly over 15 percent of the consumption would be supplied by imports. Production would then equal about 730,000 pounds, valued at 1.8 million dollars.

Duty increased by 50 percent.—Imports might be approximately 30,000 pounds, having a foreign value of approximately \$45,000. These imports would constitute less than 4 percent of consumption. Under these conditions production might amount to 880,000 pounds, with a value of 2.1 million dollars.

Exports

Exports, first separately reported in 1936, averaged 183,000 pounds, valued at \$553,000, annually during the period 1936-39, or about 10 percent of United States production. The unit value of the yarn exported was considerably higher than the average value of the domestic yarn produced, indicating, probably, that the bulk of the exports consisted of ply yarns and fine-size singles. Exports, which in 1939 went mainly to Argentina, Cuba, Mexico, Sweden, Brazil, and Canada, may be expected to continue in reduced volume after the war. Total exports, which probably will be less than half those in 1939 and will be valued at about \$150,000-\$200,000, may constitute between 8 and 15 percent of the production, depending on the levels of income both in the United States and abroad.

Employment

The number of firms operating in the spun silk industry has been reduced to 5 and the number of employees possibly to about 1,000. Inasmuch as the post-war output of spun-silk yarn may be only a third or a half of the pre-war level, employment in the mill operations applicable solely to spun silk may also be very much lower than in 1939. In the post-war period, however, most of the mills that have made spun-silk yarn as well as other mills may be expected to produce much larger quantities, than in 1939, of yarns made from staple fiber of rayon and of nylon, and also yarns made from wastes of these fibers. Moreover, an increasing proportion of their post-war output is likely to consist of blended yarns and fancy combination twists. Any loss in employment resulting from a smaller post-war production of spun-silk yarn is, therefore, likely to be more than offset by a greater production of newer type yarns.

BROAD SILKS

Tarif paragraph: 1205.

Commodity: Woven silk fabrics (except pile).

Rates of duty: 30, 45, 50, 55, 60, and *Equivalent ad valorem (1939):* 65 percent ad valorem 51.4%
form.

Notes.—The rates fixed in the *Tarif Act of 1930* were 55% ad valorem on fabrics exceeding 30 inches in width, 60% on those not exceeding 30 inches in width, and 65% on Jacquard-figured fabrics of whatever width. Rates were reduced on certain items coming within the foregoing classifications, to 30, 45, and 50% pursuant to trade agreements with Switzerland and France, effective February 15 and June 15, respectively, in 1931.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	12,136	1,104	12,064	1,205	12,399	Percent 9.1
Value (\$1,000).....	23,509	427	23,142	2,961		
Unit value (per pound).....	\$2.75	\$4.10	\$2.74	\$2.29		
Persons employed (number).....	9,899					

¹ Quantity (reported in yards) converted to weight basis, estimating 5.6 yards per pound. Exports exclusive of shipments to Puerto Rico and other noncontiguous territories.
 Foreign value.

Woven piece goods, designated in the trade as broad silks, are fabrics over 12 inches in width, with a nonpile surface, composed wholly, or in chief value, of silk. They include goods woven in the gray state for further finishing by bleaching, printing, or piece dyeing, and fabrics woven in whole or in part of dyed yarns. Width largely governs the general use of broad silks. Fabrics up to 30 inches in width are utilized mainly in the manufacture of neckties, umbrellas, and millinery; those ranging from 30 to 50 inches in width are used principally for women's wearing apparel; and those 50 inches or more in width are used mostly for upholstery, drapery, and interior decorating.

Shipments from Japan and China accounted for about three-fourths of the total quantity (by weight) of imports in 1939; those from France were about 9 percent and those from the United Kingdom about 7 percent. The remainder were about equally divided between Italy and Switzerland.

Fabrics imported from Japan and China in pre-war years differed substantially from those entered from European countries. Asiatic broad silks, which averaged about \$2.25 per pound in 1939, consisted principally of plain-woven, staple fabrics, distinctly oriental in type, such as pongees, spun-silk Fuji cloth, and habutai (China silk). Habutai accounted for about four-fifths of the imports from Japan alone in the immediate pre-war years. European broad silks, which averaged \$6.60 per pound, were mainly prestige goods noted for their quality of workmanship and material or originality of design. They were largely for the ultrafashionable trade and were frequently imported on a "confined" order basis to preserve style exclusiveness.

French silks entering this country were principally sheer fabrics such as chiffons, chiffon crepes, mousselines de soie, marguierettes, etc.; many of the fabrics were hand-woven or block-printed by hand. Imports from the United Kingdom were largely heavy upholstery fabrics, fine silk shirting materials, and printed and Jacquard-woven cravat silks. Italian shipments were largely narrow-woven, yarn-dyed Jacquard-figured silk fabrics for neckties. Imports from Switzerland were usually of a similar type. In addition, both Italy and Switzerland supplied a considerable quantity of piece-dyed silk mixtures, primarily so-called gloria umbrella fabrics. During the war, imports have declined to a small fraction of the pre-war volume.

Pre-war United States production of all-silk and silk-mixed fabrics consisted largely of medium-grade staples and such novelties as could be manufactured in large quantities by mass-production methods. Because of the competition of rayon, the output of silk fabrics in this country has declined substantially during the last decade. Production fell from almost 60 million pounds, or over two-thirds of the total output of silk and rayon broad-woven goods in 1929, to about 12 million pounds, or less than 4 percent of the total in 1939.

POST-WAR SHORT TERM

Consumption of woven silk fabrics in the short term will probably be considerably smaller than in 1939. Domestic production for civilian use ceased in 1941, after the Government acquired for military use all stocks of raw silk. Little raw silk will be available for domestic mills or for those in Europe until Asiatic sources of supply again become available to supplement the small output obtainable from Italy. Silk fabric mills in both France and Italy may require some time to resume operations, which have been disrupted by the war, whereas those in the United Kingdom will be confronted with a shortage of raw material. Reports indicate that during the war Japan has used large quantities of silk in lieu of cotton and wool, and may, therefore, have no large surplus for export immediately after the termination of the war. The extent to which its silk-weaving industry has been disrupted has not been disclosed, but it may be assumed that Japan will endeavor to resume its important export trade in raw silk as early as possible.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of broad silks is expected to continue its downward trend. It appears that both domestic production and imports will be affected materially by the reduced demand. Not only will imports vary considerably with the prevailing rates of duty, but 50 percent increases or decreases in the duties themselves may result in important changes in the composition, as well as the sources, of the imports received. In 1939 nearly a fourth of the imports, in terms of quantity, were relatively high-priced fabrics from continental Europe and the United Kingdom. These imports, accounting for nearly a half of the total value in that year, were quality fabrics which do not ordinarily compete on a price basis with the lower-cost fabrics obtained from Japan and China.

Because of the prestige attached to these fabrics, it is probable that consumption (and therefore imports) of the European fabrics will be affected less by changes in the rates of duty than the consumption of domestically produced silks and those imported from Asia will be. The relative stability in the demand for the European quality products, notwithstanding alterations in the rates of duty, may result in important shifts in the proportion of imports coming from the two principal producing areas. Corresponding changes in the composition and in the average unit cost of the imported products may also be expected. For similar reasons the increased competition by the newer and improved types of synthetic products is expected to have less effect on the demand for fabrics ordinarily imported from Europe than upon imports from China and Japan.

Because of further inroads which may be made by nylon as well as by other synthetic fabrics during the post-war period, consumption of silk fabrics may decline to less than half of that in 1939, or to 6-7 million pounds, depending in part on the assumptions as to duty. Domestic production might be reduced to 45-50 percent of that in 1939 and be within the range of 5.5-6.0 million pounds or more, valued at 15-17 million dollars. Depending on the prevailing rate of duty, imports might total 0.3-1.3 million pounds, with a foreign value of 1.3-4.0 million dollars or more. At this level of income, imports would supply 5-20 percent of consumption.

Duty as in 1939.—Total imports are likely to be 600,000-700,000 pounds and supply about 10 percent of consumption. Because of their special consumer appeal, it is not expected that imports of European fabrics will decline as much as those from Asia. Although imports from Europe may be about 80 percent of those in 1939, they are likely to constitute a materially higher proportion of the total than formerly. Imports from Asia, on the other hand, might be only about 45 percent of the quantity in 1939. The larger proportion of fabrics from Europe would tend to raise the average foreign unit value of total imports from \$3.30 in 1939 to about \$3.40. Total imports would then amount to about 2.2 million dollars (foreign value). Domestic production might be about 6 million pounds, and be valued at approximately 16.5 million dollars.

Duty reduced by 50 percent.—Imports might amount to 1.3 million pounds, or about 20 percent of total consumption. Those from Asia might be more than twice as large as they would be with no duty change and slightly more than they were in 1939. On the other hand, imports from Europe, which probably would not be as greatly affected by the decrease in duty, might amount to 25 percent more than in 1939. Oriental broad silks therefore might constitute nearly three-fourths of total imports. This shift would tend to reduce the average unit value of total imports to about \$3.10 a pound. Their foreign value would accordingly be slightly over 4 million dollars. Production might be about 5.5 million pounds, valued at approximately 15 million dollars.

Duty increased by 50 percent.—Imports might be 300,000-400,000 pounds and would thus supply 5-6 percent of domestic consumption. Shipments from Japan might be only 20 percent of the quantity imported in 1939. Imports of European broad silks, on the other hand, would probably constitute almost half of the total, but be only 50 percent as large as they were in 1939. The proportionately larger

volume of imports of fabrics from Europe would tend to increase the average unit value to about \$3.70 per pound. Total imports would then have a foreign value of 1.3 million dollars. Production would probably be more than 6.1 million pounds, or about 50 percent of that in 1939, with a value close to 17 million dollars.

Per capita income 75 percent higher than in 1939.

As a result of further inroads of the synthetic fibers, and notwithstanding an increase in consumer purchasing power, consumption of silk fabrics may be only 20 percent greater than with income at the 1939 level, or 7.5-8.0 million pounds, depending in part on the assumption as to duty. With a probable increase in the general price level, the unit values of the fabrics domestically produced, as well as those imported, may increase by about 15 percent over those in 1939.

Duty as in 1939.—Imports might be about 800,000 pounds and would thus supply about 10 percent of consumption. At a unit cost of about \$4.05 per pound, the foreign value of imports would be slightly over 3 million dollars. Production might exceed 7 million pounds and might be valued at about 22.5 million dollars.

Duty reduced by 50 percent.—Imports might total 1.4 million pounds. About 18 percent of consumption would then be supplied by imports, which, at a unit cost of about \$3.65 a pound, would have a foreign value of about 5 million dollars. Production might be about 6.7 million pounds, with a value of about 21 million dollars.

Duty increased by 50 percent.—Imports of broad silks might be about 500,000 pounds, or about 7 percent of consumption. Principally because of the increased proportion of higher priced silks imported, the unit cost might increase to about \$4.15 per pound, making the aggregate foreign value of imports about 2 million dollars. Production might be 7.3 million pounds, with a value of about 23 million dollars.

Exports

Generally, United States exports of broad silks have been less than 1 percent of domestic production. Exports attained a record high, estimated at about 1.5 million pounds (9 million yards) and valued at 10 million dollars, in 1910; during the period 1925-29, they averaged about 460,000 pounds (2.8 million yards), valued at 3.5 million dollars. Since then they have declined materially, amounting in 1939 to about 104,000 pounds (580,000 yards), with a value of \$427,000. The principal markets have been Canada, Cuba, Australia, the Philippine Islands, and Mexico. In view of the probable further displacement of silk by rayon and other synthetic fabrics, both the quantity and value of future exports may be expected to decline. The proportion of exports to domestic production will continue to be small.

Employment

The decline in broad-silk weaving, anticipated in the post-war period, might result in a reduction in the number of wage earners actually employed on silk fabrics from approximately 10,000 in 1939 to about 5,000. Broad silks are made in mills predominantly engaged in the weaving of rayon, nylon, and other synthetic textiles. The interchangeability of equipment and the similarity in technique of

manufacture facilitate the transfer of the labor force from the production of one fabric to another in accordance with the demand. With an increase of 75 percent in the per capita income, the number of workers engaged in the production of broad silks might be about 5,500. Because of the small ratio of imports to domestic consumption, total employment will be affected only moderately by the assumed changes in duty of 50 percent in either direction.

SILK VELVET RIBBONS (FAST-EDGE)

Tariff paragraph: 1206.

Commodity: Velvet and plush ribbons.

Rate of duty: 50 percent ad valorem.

NOTE.—The rate fixed in the Tariff Act of 1930 was 60 percent ad valorem, which was reduced to 50 percent effective June 15, 1934, pursuant to the trade agreement with France.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (pounds).....	57,988
Value.....	\$235,106
Unit value (per pound).....	\$4.05

¹ Foreign value.

Velvet ribbons, alternately referred to as pile ribbons, find their principal use as millinery and dress trimmings, sashes, beltings, hair bows, lamp-shade bindings, and various other accessories for apparel and home decoration. Silk is used interchangeably with cotton and rayon for both the pile and ground fabric. Velvet ribbons may be either woven with fast edges on special ribbon looms or they may be made by splitting wide velvet fabrics into strips and then gumming the edges to prevent fraying. Cut-edge pile ribbons with simulated selvages can be produced at much lower costs than the fast-edge type, and are acceptable substitutes where durability is not a requirement.

Pre-war consumption of fast-edge velvet ribbons was supplied wholly by imports, principally from France and Switzerland. Domestic production of the fast-edge type, which was never large, ceased in the middle twenties because of the instability of demand and growth of the substitute cut-edge velvet ribbon business. During the depression, cut-edge ribbons, made largely from rayon pile fabrics, supplied the bulk of the domestic demand. With the decline in the production of silk pile fabrics, which have been almost completely displaced by rayon, there is virtually no domestic output of cut-edge pile ribbons in chief value of silk.

Current fashions determine the consumption of pile ribbons during any given season or period of years. The maximum reported annual imports of silk pile ribbons amounted to 480,000 pounds in 1913; the minimum, amounting to 11,000 pounds, occurred in 1934. The volume of silk velvet ribbons imported in 1939 was 58,000 pounds; this constituted 46 percent of the total trade in pile ribbons, which aggregated 127,000 pounds, including about 69,000 pounds of rayon velvet ribbons dutiable under paragraph 1307. In that year, the proportion of velvet ribbons of silk was the lowest on record. The

shift in consumption from silk to rayon pile ribbons can be ascribed largely to the difference in price between the two products; in 1939 the average unit value of imports of silk pile ribbons was \$4.05 per pound, whereas that of rayon pile ribbons was \$2.09. Although the compound rate of duty on rayon ribbons was equivalent, in 1939, to 62 percent ad valorem, compared with the flat 50-percent rate on silk ribbons, the duty on silk ribbons, in terms of dollars, was greater by half than that on rayon ribbons.

POST-WAR SHORT TERM

Imports of silk pile ribbons in the immediate post-war period will probably be only a negligible fraction of the volume in 1939. This estimate is based on the scarcity of raw silk, the dispersal of workers into other fields of production during the war, and the reported disorganization of the French industry.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Although the volume of imports is highly unpredictable, largely because of vagaries of fashion, in making the estimates which follow it is assumed that velvet ribbons (including both rayon and silk) will continue in vogue and that the per capita consumption, with income and prices unchanged, will remain at the level of 1939. Under the various assumptions as to tariff rates, the entered unit values of pile ribbon imports, including duty, would average between 75 and 85 percent higher for those of silk than for those of rayon. Popular demand would undoubtedly favor rayon at the lower price, thus maintaining the trend of a declining ratio of silk velvet ribbon imports to the total pile ribbon imports. This circumstance would tend to reduce the proportion of silk velvet ribbons, which might decline to 10-15 percent of the total ribbon imports, compared with 46 percent in 1939.

The duty on silk ribbons, because of their greater unit value, is more than 50 percent higher, in terms of dollars, than that on rayon ribbons. This has the effect of increasing for the consumer the margin of cost between the two products, a fact particularly important when considering the effects of changes in the rates of duty. Proportionate decreases in the duty on both silk and rayon velvet ribbons would tend to narrow this margin and thereby retard the trend toward a higher relative consumption of rayon pile ribbons, whereas increases in the duty would tend to accelerate this trend.

Duty as in 1939.—Imports of silk pile ribbons may possibly be about 20,000 pounds, or about 35 percent of the quantity imported in 1939. At the level of prices prevailing in 1939, this volume would have a total foreign value of approximately \$80,000.

Duty reduced by 50 percent.—A lower rate of duty might result in increasing imports to about 40 percent of the 1939 volume, or to 22,000 pounds, having a total foreign value of \$89,000.

Duty increased by 50 percent.—The higher duty might restrict imports to about 16,000 pounds, or approximately 30 percent of the 1939 volume, and to a total value of \$65,000 (foreign value).

Per capita income 75 percent higher than in 1939.

If velvet ribbons continue in the mode, consumption will undoubtedly reflect the larger per capita income as well as increased population. Assuming no change in duty, total consumption of pile ribbons of the fast-edge type would probably increase somewhat in proportion to the rise in real income. Imports of silk velvet ribbons may then possibly be 25-45 percent of 1939 imports, whereas rayon ribbons, because of their lower relative cost, may be three or more times as great as they were in 1939. Silk velvet ribbons may constitute only about 10 percent of the total estimated imports of pile ribbons.

Duty as in 1939.—Imports may attain a volume of 22,000 pounds, or about 40 percent of the quantity entered in 1939, and may have a foreign value of about \$100,000.

Duty reduced by 50 percent.—With lower rates of duty, imports might possibly reach nearly 45 percent of the 1939 volume, or about 25,000 pounds, having a foreign value of about \$115,000.

Duty increased by 50 percent.—Higher rates of duty would possibly cause imports to decline to about 25 percent of the 1939 level, or to about 15,000 pounds, with a foreign value of about \$69,000.

PLAIN SILK HANDKERCHIEFS AND WOVEN MUFFLERS, NOT ORNAMENTED

Tariff paragraph: 1209.

Commodity: Handkerchiefs and woven mufflers, wholly or in chief value of silk.

Rates of duty: 30, 35, 40, 45, 55, or 60 percent ad valorem. *Equivalent ad valorem (1939):* 54%

NOTE.—The Tariff Act of 1930 provided a duty of 85 percent ad valorem for unhemmed silk handkerchiefs and 60 percent ad valorem for those hemmed or hemstitched, regardless of value or printing. Pursuant to the trade agreement with the United Kingdom, effective January 1, 1939, the rates of duty were reduced on silk handkerchiefs and woven mufflers valued at more than \$5 per dozen, as follows:

Not hemmed:		
If block-printed by hand.....	30%	ad val.
Other.....	45%	ad val.
Hemmed or hemstitched:		
If block-printed by hand.....	35%	ad val.
Other.....	45%	ad val.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 dozens).....	339
Value (\$1,000).....	267
Unit value (per dozen).....	\$0.79

† Foreign value.

Plain silk handkerchiefs and woven mufflers are cut to size from silk fabrics and are usually finished by hemming or hemstitching. Domestic silk handkerchiefs are usually machine-hemmed or hemstitched, whereas most of those imported are made with hand-made or hand-rolled hems. Silk mufflers are made in the same manner as silk handkerchiefs but are larger in size and usually of heavier materials. The silk fabrics most commonly used in making handkerchiefs are habutai, pongee, and crepe de chine. These plain-woven

fabrics are of various weights and qualities. Silk mufflers are made from twills, foulards, crepes, and other fabrics heavier than those used for handkerchiefs. In the United States, few silk handkerchiefs are made from imported fabrics.

United States production of plain silk handkerchiefs and mufflers is not separately recorded. It is known, however, that the output of plain silk handkerchiefs is small and that imports supply the bulk of consumption. On the other hand, imports of silk mufflers are small and the bulk of consumption is supplied by domestic production.

Total imports of silk handkerchiefs and woven mufflers in the 5-year period 1934-38 averaged annually \$421,000, compared with \$267,000 in 1939, and \$142,000 in 1940. Japan was the principal source of imports, usually supplying over 95 percent of the quantity and accounting for about 75 percent of the value. Imports from Japan, chiefly handkerchiefs, were valued in 1939 at 57 cents per dozen, compared with \$7.00 per dozen for imports from the United Kingdom, which were chiefly men's mufflers.

POST-WAR SHORT TERM

In the immediate post-war period, imports of plain silk handkerchiefs will probably be small. Japan will probably not be in a position to export them and the scarcity of raw silk in the English and European markets will restrict the manufacture of woven mufflers.

POST-WAR LONG TERM

Consumption, Production, and Imports

Plain silk handkerchiefs are for decorative purposes, whereas mufflers are mainly for sportswear. In the estimates which follow it is assumed that the vogue for silk handkerchiefs and mufflers will continue. On the other hand, it is possible that rayon, nylon, and other synthetic fibers will be substituted to a large extent for silk. If this should occur, the quantity of imports under the various assumptions as to duties and income would be decidedly smaller than indicated. These estimates will also be based on the assumption that Japan will again supply handkerchiefs.

Per capita income at 1939 level.

It is assumed that the foreign unit value of imports will not vary under the various assumptions as to decreases or increases of 50 percent in duty, and that it will be approximately that in 1939 (\$0.79 per dozen).

Duty as in 1939.—Imports may be about 375,000 dozen, with a foreign value of \$300,000.

Duty reduced by 50 percent.—Imports might be 20 percent more than they would be if there were no change in duty, or about 450,000 dozen, with a foreign value of \$360,000.

Duty increased by 50 percent.—Imports might be about 340,000 dozen, with a foreign value of \$270,000.

Per capita income 75 percent higher than in 1939.

It is assumed that the foreign unit value under the various assumptions will be about 10 to 15 percent higher than in 1939, or about \$0.90 per dozen.

Inasmuch as silk handkerchiefs and mufflers are luxury articles, consumption may be 50 percent more than it would be if the national income remained at the 1939 level.

Duty as in 1939.—Imports might be about 560,000 dozen, with a foreign value of \$500,000.

Duty reduced by 50 percent.—Imports may be twice the quantity in 1939, or 675,000 dozen, having a foreign value of \$600,000.

Duty increased by 50 percent.—Imports would probably drop to about 500,000 dozen, with a foreign value of \$460,000.

Exports

Exports are not statistically recorded but are known to be very small.

SILK WEARING APPAREL

Tariff paragraph: 1210.

Commodity: Silk wearing apparel, not knit.

Rate of duty: 65 percent ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	150,000	700	149,300	500	149,800	Percent 0.3

¹ Estimated; see text.

² Export statistics include, without segregation, those articles dutiable under par. 1210, silk wearing apparel ornamented with lace or embroidery (dutiable under par. 1529 (a)), and knit apparel other than hosiery (dutiable under par. 1205). The total value of exports in 1939 was \$623,000, of which it is estimated that about \$700,000 were comparable to imports under par. 1210.

³ Estimated landed value, allowing 5 percent for landing charges; foreign value was \$395,000.

The last official figures on the domestic production of silk wearing apparel are for 1935, when census data indicated an output of about 350 million dollars, including women's silk dresses valued at 283 million dollars. It is known that domestic production of silk wearing apparel has declined substantially since 1935 but there is very little available information on which to base an estimate of the output in 1939. Probably the value of production in that year was somewhere between 100 million and 200 million dollars. For the purposes of this report 150 million dollars is taken as a rough approximation of the value of the output of silk wearing apparel in 1939.

Most of this apparel is produced in the women's clothing industry in which specialization is based on the type, the price range, or the age group for which the garments are designed, and rarely, if ever, on the material used; for this reason, there are virtually no establishments devoted exclusively to making silk garments. The silk garments produced include women's dresses, coats, suits, skirts, blouses, sleeping and lounging garments, and underwear, as well as children's and infants' wear. Apparel made of silk constitutes a small part of the

production of the women's garment industry, whose total product in ordinary times is valued at over 1 billion dollars a year. Neckties and scarfs are virtually the only articles of silk men's wear manufactured on an important scale although there is a relatively small production of lounging garments and underwear. Statistics are not available, but it is known that before the war the United States was the largest producer of factory-made wearing apparel of silk. Domestic production of silk wearing apparel is centered in New York City.

United States imports of silk wearing apparel have been declining for several decades. Imports were very large in the decade before World War I, reaching a record high of 5.3 million dollars in 1911. They declined during that war, but there was a substantial revival of imports in the succeeding decade; the competition of domestically produced silk and rayon wearing apparel in the 1930's, however, resulted in a gradual curtailment of imports. They averaged about \$800,000 in the 8 years, 1931-38, but declined to \$389,000 in 1938; in 1939, they declined still further to \$295,000, the lowest value in more than 50 years.

Imports of silk wearing apparel in the decade 1931-40 were principally from Japan, France, and the United Kingdom. Most of the imports from England and European countries sell at higher prices than the most comparable domestic products. Those from Japan, consisting principally of lounging garments, were mostly competitive in price with domestic production, and during 5 years of the decade 1931-40, accounted for over half of total imports. Any change in the rate of duty would probably have a greater effect on imports from Japan that compete on a price basis than on imports of the higher-priced garments from Europe.

POST-WAR SHORT TERM

Because of an expected small supply of raw silk in the immediate post-war period,¹ domestic production and imports of silk wearing apparel will probably be very small compared with the pre-war period. Synthetic fibers, including nylon as well as rayon, will probably be used in many garments formerly made of woven silk.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

It is doubtful whether silk wearing apparel, even in the long term, will regain its pre-war position in the United States market. Rayon has already made heavy inroads in the field formerly held by silk, and nylon and other synthetic fibers appear to be in a position to make further inroads in this market. With per capita income at the 1939 level, the relative price of raw silk, compared with prices of other fibers, might possibly restrict its use to such an extent that, despite the increase in population, consumption of silk wearing apparel might be only about 50 percent in terms of value of that consumed in 1939, or in the neighborhood of 75 million dollars a year. Inasmuch as im-

¹ See the section on raw silk (par. 1703).

ports are only a small fraction of consumption, for the purposes of this discussion, production and consumption are considered as approximately the same.

Duty as in 1939.—Imports might constitute about the same proportion of consumption (about 0.3 percent), as in the immediate pre-war years, in which case imports would amount to \$150,000 a year (foreign value).

Duty reduced by 50 percent.—With a reduction in duty there would probably be increased imports of silk garments competitive in price with those made in this country. At the same time, imports of higher-priced garments might be stimulated to some extent, so that total imports might be about \$400,000 to \$500,000 a year (foreign value), or about three times the amount estimated with no change in duty.

Duty increased by 50 percent.—With an increased duty, there would probably be few, if any, imports of garments in the price classes which compete with domestic production. Imports would therefore be almost entirely of a luxury character. They might be in the neighborhood of \$125,000 a year (foreign value).

Per capita income 75 percent higher than in 1939.

With an increase in per capita income, price would probably be less of a controlling factor in determining the proportion of wearing materials made of silk and that made of synthetic fibers. Assuming prices of silk and competitive fabrics to have the same percentage increase, the higher national income might cause a disproportionate part of the increased consumption of wearing apparel to be supplied by articles of silk. Silk garments might, therefore, supply a somewhat larger part of the estimated increase in total consumption of wearing apparel. Consumption might be valued at about 100 million dollars a year.

Because of an expected greater demand for luxuries, the increase in imports might be proportionately greater than the increase in consumption. Imports might be about double those estimated with no change in national income. On this assumption, the following estimates of imports are made.

	<i>Estimated imports (foreign value)</i>
Duty as in 1939.....	\$300,000
Duty reduced 50 percent.....	1,000,000
Duty increased 50 percent.....	250,000

Exports

Although export data are not available, estimates of exports show that they have been larger than imports in the decade preceding the war. Assuming a relatively higher price for silk than for other competitive fibers, it is probable that exports might be \$400,000-\$800,000 a year.

Employment

Inasmuch as specialization in the women's clothing industry is rarely, if ever, based on the material used, statistics are not available to show the number of employees engaged in the manufacture of silk wearing apparel. It is therefore not possible to make estimates of employment in the manufacture of silk wearing apparel under the various assumptions.

SILK BOLTING CLOTHS FOR MILLING PURPOSES

Tarif paragraph: 1030.
 Commodity: Bolting cloths composed of silk, imported expressly for milling purposes, and permanently marked so as not to be available for any other use.
 Rate of duty: Froc.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	20
Value (\$1,000).....	587
Unit value (per pound).....	\$28.95

¹ Foreign value.

Silk bolting cloth is a strong, open-mesh fabric, principally used for flour milling or for screening grit and other foreign substances from abrasives, metal powders, explosives, starch, paints, and chemicals. In recent years silk bolting cloth has acquired an additional use in the "screen printing" (stencilling) of textile fabrics, signs, and ornamental displays. To be admitted free of duty, silk bolting cloth must be indelibly marked, so as to prevent its use for other than milling purposes. Bolting cloth not so marked and not intended to be used in milling operations is dutiable under paragraph 1205 at 30 percent ad valorem.

Silk bolting cloth used for extractive purposes is leno-woven, the threads being secured against shifting by means of a special binding and crossing motion of two distinct sets of warp threads. The finest grades are made on hand looms. Lower grades and coarser sizes are produced to some extent on power looms. Consumption of leno-woven silk bolting cloth in this country has been supplied entirely by imports. Plain-woven bolting cloth was manufactured on a small scale before the war by one domestic broad-silk weaving company, formerly associated with a French producer.

The manufacture of leno-woven bolting cloth similar to the imported variety has never been attempted here commercially because of the technical precision necessary to secure meshes of absolute uniformity of size, and the narrow market for this highly specialized fabric. Manufacturers in Switzerland and France, on the other hand, have world-wide export markets permitting them to make in limited yard-ages the very extensive range of mesh constructions required by various industries.

Average annual imports in the 5-year period 1935-39 amounted to about 15,000 pounds valued at \$463,000 as compared with 14,400 pounds valued at \$543,000 in the 5 years, 1940-44. Switzerland was the principal supplier; small imports were received in addition from France and Italy.

POST-WAR SHORT TERM

In the immediate post-war period imports of silk bolting cloth will probably be about the same as in pre-war years, or in the neighborhood of 15,000 pounds a year. The unit value abroad of bolting cloth which increased from about \$29 per pound in 1939 to almost \$50 a pound in 1944, is not likely soon to return to its pre-war level. Assuming a foreign unit value of about \$40 per pound, imports in the immediate post-war period may have an aggregate value of possibly \$600,000.

POST-WAR LONG TERM

Inasmuch as the per capita consumption of cereals is not materially affected by changes in national income, it may be assumed that imports of silk bolting cloth for milling purposes will be approximately the same whether per capita income remains as in 1939 or is increased by 75 percent.

Because of population growth, imports may increase about 10 percent over the pre-war period (1935-39) or to possibly 17,000 pounds.

With the eventual reduction in prices of raw silk from the high wartime level, the foreign value of silk bolting cloths may drop to an average of about \$35 a pound. On this basis the value of the imports in the long-term post-war period may be about \$595,000 a year.

SILK WASTE

Tariff paragraph: 1762.

Commodity: Cocoons and silk waste, n. s. p. f.

Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	3,597
Value (\$1,000).....	1,040
Unit value (per pound).....	\$0.289

¹ Foreign value.

Silk waste consists largely of pierced and defective cocoons and of imperfect silk filaments discarded in reeling raw silk. It finds its main use as raw material for the spun silk yarn manufacturing industry (see paragraph 1202). Virtually no silk waste of this character is produced in the United States, since sericulture and silk reeling are not conducted in this country on a commercial scale. Domestic waste suitable for processing by spun silk mills is limited to the soft, untwisted types of thread waste obtained from the processing of raw silk in throwing, weaving, and knitting plants. Small quantities of this mill waste have been imported from Canada and the leading European silk-manufacturing countries.

At their peacetime maximum, imports of silk waste, which have been obtained principally from China, Japan, and Italy, averaged 12 million pounds annually in the period 1925-29. In the 3 years immediately preceding the entry of the United States into the war, they averaged about 2½ million pounds, the lowest since 1909. This decline in imports was caused by the curtailment in production of spun silk yarn which, in turn, resulted from changes in style, the increasing popularity and declining costs of synthetic fibers, and the widening price disparity between spun silk yarns and raw silk during the sericultural crisis of the thirties.

The quantity of waste silk imported in 1939 was almost twice that during the preceding year, and one-third larger than that in 1940. Imports virtually ceased after July 1941, when the United States Government imposed exchange controls and took over the assets of Japanese and Chinese nationals in this country. The processing, sale, and delivery of imported and domestic silk waste

from stocks which had been frozen were placed under priority control and use was permitted only for meeting military requirements. The chief use of waste silk in wartime has been in the manufacture of coarse-count yarns for cartridge cloth and lacing cord required in making powder containers for large Navy turret guns and other heavy ordnance.

During the period 1937-39, China, formerly the world's largest supplier of silk waste, exported about 10 million pounds annually. Until the revival of sericulture in central and southern China, probably only a million pounds of silk waste will be available from the western provinces. Much of this will probably be of an inferior quality, unacceptable for utilization by the spun-silk industry in the United States. Because of their relatively higher labor costs, domestic producers of spun silk are more dependent upon the better grades of waste than European producers are.

POST-WAR SHORT TERM

Stocks of imported waste will have been depleted, and the release of remaining domestic supplies of old silk stockings, which were stock-piled for military use, will be of little use to the spun silk yarn industry. The fiber reclaimed from old silk hosiery by picking and garnetting processes would not be usable for the production of the fine and medium-grade spun silk yarns required in the manufacture of the civilian products formerly in demand.

POST-WAR LONG TERM

Although imports of silk waste enter free of duty, the spun silk yarns for production of which silk waste is imported, are subject to duties which averaged 48 percent ad valorem in 1939. Future imports of silk waste will, therefore, depend principally upon the output of spun silk yarn, which in turn may be affected considerably by the prevailing rates of duty. The volume of imports will also depend in some degree upon the price of waste silk. To compete successfully with the synthetic fibers, the spun silk industry would probably require waste supplies at a price no higher than the average for the decade 1930-39, which was about 23 cents per pound.

Per capita income at 1939 level.

With no change in duty on spun silk yarn, United States production would probably be about one-third of the quantity in 1939 and imports of waste would, therefore, be about 42 percent of 1939 imports, or about 1.5 million pounds. At an average foreign price of 23 cents per pound, the imports would be valued at \$345,000.

A decrease of 50 percent in the duty on spun silk yarn would tend to stimulate imports and to curtail domestic production of this product, thereby reducing the requirements of silk waste. Imports of waste might then amount to approximately 39 percent of 1939 imports, or to about 1.4 million pounds, with a foreign value of about \$320,000. A 50-percent increase in the duty on spun silk yarn would probably result in imports of silk waste amounting to about 45 percent of 1939 imports, or to about 1.6 million pounds with a foreign value of about \$370,000.

Per capita income 75 percent higher than in 1939.

With the higher level of national income and with no change in duty on the yarn, imports of silk waste might be 33 percent greater than estimated for the lower income level. Imports of waste might then be 2 million pounds or about 55 percent of 1939 imports. The curtailment of production of spun silk yarn which would result from a 50-percent decrease in duty on that product would probably reduce the consumption, and hence imports of silk waste, to about 1.8 million pounds, or to about 50 percent of 1939 imports. The foreign value of such imports might be about \$475,000. Conversely, with an expansion in the production of spun silk yarn, which might follow a 50-percent increase in the rate of duty, imports of waste silk would probably be about 2.2 million pounds, with a foreign value of about \$570,000. These imports would represent about 60 percent of 1939 imports.

RAW SILK

Tariff paragraph: 1763.

Commodity: Raw silk in skeins reeled or re-reeled, not wound, doubled, twisted, or advanced (including tussah or wild silk).

Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds).....	48, 216
Value (\$1,000).....	111, 648
Unit value (per pound).....	\$2. 32

¹ Foreign value.

The silk-consuming industries in the United States depend entirely on imports inasmuch as sericulture and silk reeling, though frequently attempted in this country, have never proved permanently successful. In the decade 1931-40, imports of raw silk into the United States averaged about 56 million pounds annually, of which Japan supplied 90 percent, China 7 percent, and Italy 3 percent. During this period the trend of imports was downward, both in quantity and in value; from a record of 87 million pounds, valued at 427 million dollars in 1929, imports declined to about 52 million pounds, valued at 121 million dollars in 1939; and to 45 million pounds, valued at 125 million dollars in 1940. The import trade in raw silk virtually ceased after the United States took over Japanese assets in this country in July 1941. Because of the strategic military importance of raw silk, existing stocks were thereupon frozen by Government order and the processing of silk for civilian use was prohibited.

Early in 1942, mill and warehouse stocks of raw silk, estimated at 10 million pounds, were requisitioned for the Government stock pile. Thereafter Government-owned silk was rationed, principally to manufacturers of parachutes, surgical sutures, and electrical insulation. The rapid depletion of the stock pile resulted in the substitution of nylon and high-tenacity rayon yarn for many military purposes. Nylon, which became an important substitute for silk in supplying civilian requirements after the cessation of silk imports, was thereupon also reserved by the Government for essential war uses.

Formerly silk found its principal peacetime outlet in the broad-silk-weaving industry. After 1933 this industry shifted largely to the use of rayon, which preempted all but the specialty fabric field. The trend toward a declining consumption of silk in woven goods was accelerated by important changes in the basic organization of the broad-weaving industry, the expansion of factory production of low-cost apparel, the development of high-speed automatic looms especially designed for rayon yarn, and shifts in fashion to cloth constructions adaptable for rayon. The extreme price fluctuations to which raw silk had been subjected as contrasted with the comparative stability of rayon prices, also adversely affected silk in competition with the lower cost synthetic fiber.

The full-fashioned hosiery industry became the major consumer of silk after the middle thirties. Its purchases of silk amounted approximately to 35 million pounds, or nearly 75 percent of the total net mill deliveries reported by the New York Commodity Exchange in 1939. As a result of the introduction of nylon yarn and the exceptionally high prices which prevailed for silk, consumption of raw silk by the hosiery industry was reduced in 1940. In that year, the production of nylon hosiery amounted to approximately 3 million dozen pairs, or 7 percent of the total output of full-fashioned hosiery; it increased to more than 9 million dozen pairs, or 22 percent of the total, in 1941. In July 1941, the last unrestricted operating month in the full-fashioned hosiery industry before the institution of Government controls, the production of nylon hosiery reached its pre-war maximum of nearly 800,000 dozen pairs, or more than a fifth of the total full-fashioned hosiery output in that month.

POST-WAR SHORT TERM

Only meager quantities of silk will be obtainable in the early period following the cessation of hostilities. Inasmuch as the wartime stock piles of Government-owned raw silk will have been exhausted, virtually no surpluses will be available in the United States to meet civilian requirements. Moreover, imports are likely to be small because of the delay attendant upon the restoration of sericulture in Japan, China, and Italy.

The productive capacity of nylon in the United States expanded from about 8 million pounds in 1941 to 26 million pounds in 1944, and plans have been made for further expansion in the immediate post-war period to an annual capacity of almost 40 million pounds. The output of hosiery-type yarns of nylon will probably be in the neighborhood of 23 million pounds, a volume sufficient for the production of about 38 million dozen pairs of hosiery, or about 70 percent of the hosiery formerly supplied by silk. Fine sizes of high- and medium-tenacity rayon yarns with properties especially designed for the hosiery trade will also be available to supply the remaining 30 percent of the hosiery requirements.

POST-WAR LONG TERM

The quantity of imports will depend in some measure on the price of silk. If the price of standard-grade silk in New York should be in the neighborhood of the average annual price for Japanese silk which

prevailed in 1939-41 (\$2.80 per pound),¹ it will probably be about six times the post-war price of standard rayon and will also probably exceed the price of nylon, which is likely to decline as production increases. At such a competitive disadvantage, silk would probably be consumed only in the manufacture of fashionable luxury articles. On the other hand, if the price of standard-grade silk should approximate the level of 1936-38, when it averaged \$1.75 per pound, silk might retain a share of the market for medium-priced fabrics and hosiery. It is doubtful, however, whether prices of standard-grade silk over the post-war long-term period would go much lower than \$1.50 per pound, which was the average annual price during the depression years 1932-35.

Although raw silk is imported free of duty, its use in broad-silk manufacture is affected by the prevailing rate of duty on imported woven fabrics of silk. In the post-war period, imports of silk and silk-mixed fabrics may be within the range of 5-20 percent of the total consumption of broad silks, depending on the assumptions as to income and duty (see the discussion of par. 1205). The use of raw silk by the domestic broad-silk industry will fluctuate with changes in weaving activities which in turn will be influenced by variations in income and duty; consumption in broad silks, therefore, may be 4½-6½ million pounds annually.

The level of duty on silk hosiery, silk sewing thread, and other silk products, on the other hand, will have little effect on the total consumption of raw silk, inasmuch as imports of these products have been negligible. The consumption of raw silk by the hosiery industry will depend primarily on the extent of interfiber competition and to a lesser degree on the prevailing income level. Technological developments in the preboarding of seamless hosiery made of nylon and acetate rayon will tend to eliminate the use of silk in that branch of the industry and thus restrict its consumption in the hosiery industry almost wholly to the full-fashioned product. Depending on the level of income, the production of silk hosiery in the post-war period might be within the range of 5-10 million dozen pairs annually, or 10-15 percent of the total output of full-fashioned hosiery.

Per capita income at 1939 level.

The consumption of raw silk will probably be divided about equally between the hosiery and broad-silk fabrics industries. With no change in duty on broad silks, or with the duty increased 50 percent, the weaving industry might consume 5-5½ million pounds of raw silk. A decrease of 50 percent in the duty on broad silks, on the other hand, might possibly reduce the raw silk requirements of the domestic weaving industry to 4½-5 million pounds. The full-fashioned hosiery industry might use 3½-5½ million pounds of raw silk; other uses combined might require an additional million pounds. Total domestic consumption by all industries may thus be 9-12 million pounds, or about 20-25 percent of consumption in 1939. Estimating the average foreign value of raw silk at \$1.75 per pound, the required imports would be valued at 15-22 million dollars.

¹ The ceiling price placed on standard 12/15 denier 30 grade (75 percent sulphuric) in October 1941 was \$2.80 per pound.

Per capita income 15 percent higher than in 1939.

With no change in duty on broad silks, or with a 50-percent increase in duty, the consumption of raw silk by broad-silk weavers might be 6-6½ million pounds, or about 20 percent more than if the per capita income were at the level of 1939. With a 50-percent reduction in the duty on imported broad silks, consumption of raw silk for domestic manufacture of these silks might be slightly less than 6 million pounds. Hosiery manufacturers might use 4-6½ million pounds. The combined consumption of raw silk for other purposes would probably be about 1.2 million pounds. The total consumption of raw silk might therefore be 11-15 million pounds, or about 25-30 percent of the quantity in 1939. At a unit value of approximately \$2 per pound, imports would have a foreign value of 22-30 million dollars.

SCHEDULE 13. RAYON AND MANUFACTURES

INTRODUCTION AND SUMMARY

Below are presented separate comments on the six articles in schedule 13 of the Tariff Act of 1930 which come within the scope of Senate Resolution 341 and on which report is made. In 1939 imports of these articles, all of which are dutiable, were valued at \$9,977,000 and constituted 98 percent of the total value of all commodities imported under this schedule.

The estimated production (for the domestic market) and imports for these articles have been totaled. (Where the estimates are not given in a single figure but in the form of a probable range, the middle point of the range has been taken for the purpose of tabulation.) The following tabulation compares these total estimates with actual production for the domestic market and actual imports in 1939:

Period, income level, and tariff treatment	Production for domestic market		Imports	
	Value	Percent of 1939	Foreign value	Percent of 1939
1939	<i>Million dollars</i> 499.8	100	<i>Million dollars</i> 10.0	100
Post-war long term:				
Per capita national income same as in 1939:				
Duty as in 1939	1,092.5	233	10.9	109
Duty reduced 50 percent	1,067.4	225	27.4	274
Duty increased 50 percent	1,107.6	236	2.8	28
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939	1,363.3	280	12.9	129
Duty reduced 50 percent	1,334.7	284	26.0	260
Duty increased 50 percent	1,377.5	288	4.8	48

It should be emphasized that the production figures given above do not include production for export, although, as indicated in the general introduction, the sections on particular commodities discuss post-war export probabilities. It should also be emphasized that, as pointed out in the general introduction to this report, the estimates for individual articles, under the various assumptions in the resolution, are subject to considerable, frequently wide, margins of error. Because of the small number of items represented here and the fact that two items—rayon yarn and rayon woven fabrics—greatly predominate in the totals, not much reliance can be placed upon the tendency for errors to be in both directions and thus to offset each other. For this reason, the margin of error in the totals given above may be fairly large, possibly as much as 10 to 20 percent in either direction.

Taking the figures as they stand, however, they indicate the probability that, in the post-war long term under any of the assumptions

made as to duty, production for the domestic market will be larger than in 1939 by much more than the 10-percent increase in population, even if there should be no increase in per capita national income. This conclusion would seem to be warranted in view of the rapid expansion in rayon-production facilities and of the increased use of rayon during the war. Except under the assumptions of duties increased by 50 percent, imports also will be more than 10 percent above the 1939 level. The margin of possible error in the table given above does not appear to be large enough to affect these conclusions. The probability of such increases results from the fact that, even if per capita national income should be the same as in 1939, demand in the post-war long-term period for three important articles in the schedule—rayon yarn, rayon staple fiber, and rayon woven fabrics—will certainly rise much faster than population. Moreover, with national income increased by 75 percent, there will probably be a further substantial increase in production and imports.

RAYON YARN

Tariff paragraph: 1301.

Commodity: Yarns, singles and plied, including yarns having more than 20 turns twist per inch.

Rate of duty: 45%, 50%, or 55% ad val. but not less than 45¢ per lb.; high twist yarns, basic ad val. rates and 45¢ per lb. additional, but not less than 90¢ per lb.

Equivalent ad valorem (1939): 134%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	328,625	1,604	326,931	176	327,107	Percent (²)
Value (\$1,000).....	183,248	898	181,455	59		
Unit value (per pound).....	\$0.56	\$0.53		\$0.34		
Persons employed (number) ⁴	43,000					

¹ Production of single yarns by the rayon industry only; plied and high-twist yarns not included.

² Less than one-tenth of 1 percent.

³ Foreign value.

⁴ Adjusted to exclude estimated number of employees working on products other than yarn.

The total world production of continuous filament rayon yarn increased from 434 million pounds in 1929 to 1.1 billion in 1939, and to 1.4 billion in 1942. The United States leads in the production of rayon yarn and accounted for 29 percent of the world output in 1939. Japan ranked second with 21 percent of the total, followed by Germany with 15 percent.

United States production of rayon yarn increased at an average annual rate of 21 million pounds during the period 1929 to 1939 or

from 121 million in 1929 to 329 million pounds in 1939. Since then, it has increased to 555 million pounds in 1944; the increase in production during this period was not so great, however, as the increase in requirements resulting from the war, so that the supply remaining for customary civilian uses was less than before.

Imports of rayon yarn since 1931 have averaged less than half a million pounds annually and constituted only a small fraction of 1 percent of domestic consumption. Some of the imports have been for manufacture and reexport with a draw-back of the duty. Others have consisted of varieties for which the limited demand in this country did not justify manufacture on a large scale by domestic producers. During the early and middle thirties, imports were supplied predominantly by Germany, France, and the United Kingdom. After 1935 they were largely from Japan, Italy, and the Netherlands. A feature of the trade in the latter period has been the low unit value of imports, sometimes below the average value of yarn which the exporting country supplied to other markets.

The duty on imports formerly averaged only about 60 percent of the value, but after 1935, because of the low unit value of imports, it became more than 120 percent. Practically all the imports enter at the minimum specific duty of 45 cents a pound.

Exports of rayon before the war, although many times greater than the imports, remained less than 1 percent of production. Both exports and imports were so small that production was approximately the same (except for changes in the stock position) as consumption.

Approximately 75 percent of the total supply of rayon yarn has been consumed in the manufacture of broad-woven fabrics and about 20 percent in the manufacture of knit goods. Pre-war industrial uses of rayon were relatively unimportant and were limited to the small-scale production of high-tenacity yarn for heavy-duty tires for commercial vehicles.

By far the most important war use of rayon was in tire cord, for which the authorized manufacturing capacity at the end of 1944 was 240 million pounds a year, or nearly three-fourths of the total production of rayon in 1939.

Facilities for making tire cord can be employed to manufacture high-tenacity yarn for both commercial tires and for other industrial uses, or may be converted to the manufacture of fine-size high-tenacity yarn for hosiery and special woven fabrics, for which there is expected to be an active demand.

POST-WAR SHORT TERM

During the war lack of rayon for its customary uses has created a large backlog of demand. As a result, during the first few years after the conclusion of hostilities, the market might be able to absorb over twice as much rayon annually as before the war.

Imports in the immediate post-war period will probably continue to be insignificant. The United Kingdom alone, among the usual foreign sources, may be in a position to resume its export trade. Rayon prices in the United Kingdom, however, tend to be higher than in the United States. Moreover, the United Kingdom curtailed its rayon industry during the war and like the United States will have a backlog

of civilian demand to satisfy after the return of peacetime conditions, rendering exports to the United States on any considerable scale improbable.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption in the industrial field will likely be much larger than in the pre-war period. High-tenacity rayon yarn of the type used during the war for military parachutes may continue in demand for delivery chutes for civilian aerial freight. Civilian airplane tires and heavy-duty truck and bus tires will continue to use rayon high-tenacity yarn regardless of whether natural or synthetic rubber is used. As the cost of high-tenacity yarn declines, it may take the place of cotton tire cord to an increasing extent in the lighter tires for pleasure cars, although in this field it has fewer technological and economic advantages than in heavy-duty commercial tires.

As new types of rayon have been developed and the quality improved during the war, rayon is expected to continue to expand its share of the apparel market. Nylon and silk, of course, will return to the full-fashioned hosiery industry, which has almost been monopolized by rayon during the war. Fine sizes (75 deniers and less) of rayon yarn, however, specifically made for hosiery will be available on a larger scale than formerly. Sheer full-fashioned hosiery probably will be manufactured from this yarn for sale at a price below that of nylon and silk. If so, rayon might retain a much larger share of the hosiery market than it had before the war.

The production of rayon probably not only will hold its wartime gains, but increase further, possibly to 700-800 million pounds. The average value has remained close to that in 1939 (56 cents a pound) for some time in the past, and has undergone little change during the war. If a decline of about 15 percent in price is assumed in the post-war period, the total value of production may be 335-385 million dollars a year and average about twice as great as in 1939.

Duty as in 1939.—Imports probably will remain between 150,000 and 200,000 pounds having a foreign value of \$45,000 to \$60,000 a year and represent a negligible proportion of consumption in the United States.

Duty reduced by 50 percent.—The reduced rate on the basis of the 1939 import value would be equivalent to about 67 percent ad valorem. Under the reduced minimum rate of duty, the foreign value of imports would have to be about 25 cents a pound to permit their sale in the United States at prices close to the average value of 48 cents assumed for the domestic product. The average value of exports from European countries has been uniformly in excess of 35 cents a pound. In 1938 export values of rayon yarn ranged from 36½ cents a pound for Italian yarn to 69 cents for German yarn. The average value of exports from Japan in 1938, on the other hand, ranged from 19 cents a pound in 1936 to 23 cents in 1938; the Japanese exports, however, were largely to countries in the Far East and Latin America, and they included yarns inferior in quality to those ordinarily required by weaving mills in the United States and Europe.

Imports into the United States probably would consist mostly of grades for which the limited demand did not justify manufacture on a

large scale by domestic mills. They probably would supply only limited competition with domestic yarn in the important broad-woven-goods industry, but they might represent a considerable proportion of the total consumed in the manufacture of narrow wares and trimmings. Imports, particularly if Japan becomes the chief source, might be 7 million pounds with a foreign value of slightly more than 2 million dollars a year, and might average about 1 percent of consumption in the United States.

Duty increased by 50 percent.—Imports probably would be less than 100,000 pounds having a foreign value under \$30,000 a year.

Per capita income 75 percent higher than in 1939.

Consumption of rayon yarn might increase to 850-950 million pounds a year, and be from $2\frac{1}{2}$ to 3 times as great as in 1939. All but a very small part of this amount probably would be supplied from domestic sources. In the past the list price has not fluctuated to any great extent with changes in business conditions, and presumably the unit value of production under the various duty assumptions will remain as estimated in the foregoing section with per capita income at the 1939 level. The total value of production then would be 400-450 million dollars a year.

Duty as in 1939.—Although imports might be somewhat greater than if per capita income had remained the same as in 1939 they would continue to be very small. They might be 150,000-250,000 pounds having a foreign value of \$45,000-\$75,000 a year.

Duty reduced by 50 percent.—Imports might increase to 9-15 million pounds having a foreign value of 3-4 million dollars, but they would still remain a very small part of the total consumption in the United States, probably less than 2 percent.

Duty increased by 50 percent.—Imports probably would be less than 100,000 pounds having a foreign value of less than \$30,000 a year.

Exports

Exports have been mostly to Canada, Cuba, Mexico, and the countries of Central and South America. During the war, exports have been several times greater than before, but when supplies from other sources again become available they are expected to decline although they probably will remain somewhat (perhaps 20 percent) greater than in 1939, or about 2 million pounds. With a reduction of perhaps 15 percent in price, exports would be valued between \$900,000 and \$940,000. The market for exports from the United States will be limited on a long-term basis by active competition from Japan and some European countries, and by the establishment of rayon-producing facilities in certain importing countries, of which the more important are Mexico and Australia.

Employment

The total number of workers in the rayon industry in 1939 was 48,332, of which it is estimated that more than 5,000 were engaged in the manufacture of allied products other than yarn such as staple fiber, transparent cellulose wrapping material, sausage casings, bottle caps, and sponges. The number of workers engaged in the manufacture of yarns may increase from the estimated total of 43,000 in 1939 to 55,000-70,000 on a long-term basis.

RAYON WASTE

Tariff paragraph: 1302.
Commodity: Waste of rayon except cellulose acetate.
Rate of duty: 10% ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	12,600	(?)	12,600	1,619	14,219	Percent 11.4
Value (\$1,000).....	1,465	(?)	1,465	185		
Unit value (per pound).....	\$0.116		\$0.116	\$0.11		

¹ Producers' waste only; reported by Bureau of Census.

² Exports of rayon producers' waste not separately recorded; known to be small. Reported exports of rayon waste consist of throwsters', weavers', and knitters' mill waste, clips and used rags, not comparable with the production and imports.

³ Foreign value.

Rayon waste provided for under paragraph 1302 includes untwisted filaments and twisted thread waste discarded in the manufacture of viscose and cuprammonium rayon yarn and staple fiber. The waste ratio in the rayon-yarn industry averages less than 4 percent of the viscose and cuprammonium yarn annually produced. Such yarns account for about two-thirds of the total annual output of rayon. In the manufacture of viscose staple fiber, the waste element is negligible.

Rayon waste, like staple fiber, is used in the woolen and worsted industry as a blending medium to reduce costs in periods of high wool prices or to achieve cross-dyed, lustrous, and other novelty effects in the manufacture of specialty fabrics in the fashion field. Production of waste is practically a constant ratio of the output of yarns in the rayon industry, but imports and consumption fluctuate with the activity in the wool manufacturing industry, the level of virgin-wool prices, and the relation of the price of rayon waste to that of other wool substitutes, such as wool waste, wool noils, reprocessed wool waste, cotton waste, and rayon staple fiber. The quantity of rayon producers' waste available for consumption by the wool manufacturing industry in 1939 was about 3½ percent of the quantity of raw wool (scoured basis) consumed.

Imports of rayon waste usually come from several sources; the most important are Japan, Canada, Belgium, the Netherlands, and the United Kingdom. Imports have varied widely in relation to the total apparent domestic supply, ranging from 4 percent in 1932, a year of record low wool prices, to 53 percent in 1937, a year of comparatively high wool prices. It would appear that decline in wool prices reduced the consumption of rayon waste in 1939 to only slightly more than half of the consumption in the peak year 1937.

POST-WAR SHORT TERM

With higher wool prices and an increase in the manufacture of woolen and worsted goods, the consumption of rayon waste in the early post-war period probably will be greater than in 1939 by about 10 percent. Imports will probably be less than in that year, for Japan, the Netherlands, and Belgium, usually among the sources, will probably not have resumed exportation to this country, and Canada and the United Kingdom are not likely to have rayon waste available in excess of their current needs. The expected growth of the domestic rayon industry will provide more waste than in 1939 to supply the increased demand.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

As a result of expansion in the production of rayon, the supply of rayon waste available from domestic sources will be considerably larger and may possibly be in the neighborhood of 25 million pounds a year. This amount is about as great as the production and imports combined in 1937. In addition, other materials for mixing with wool, particularly rayon staple fiber, will be increased in supply and improved in quality. Under these circumstances, it is likely that the price of rayon waste will be relatively low and that imports will be small.

The probabilities are that the price of rayon waste and the quantity imported would not be affected greatly by either a downward or an upward change of 50 percent in the 10-percent duty on the waste itself. They would be affected strongly, however, by any such change in the duties on raw wool, because of the relation which the demand for rayon waste bears to the price of wool. If the duties on raw wool were reduced 50 percent, the consumption of rayon waste and other wool substitutes would decrease, and if the duties on raw wool were increased 50 percent, the use of rayon waste and other fibers for blending with wool would increase.

Duty as in 1939.—The average value of rayon producers' waste obtained in the United States might be 8 to 9 cents a pound, compared with 11.6 cents in 1939. The assumed production of 25 million pounds then would be valued at about 2 million dollars. The lower price would operate to restrict imports, and they might be only about 1 million pounds with a foreign value of \$80,000 a year, or approximately 40 percent less in quantity and nearly 60 percent less in value than in 1939. At this level, imports would be less than 4 percent of consumption.

Duty reduced by 50 percent.—Because of the effect which a general reduction of import duties would have on the price of raw wool, the demand for rayon producers' waste (along with other fibers for blending with wool) would be reduced, and the average value of production might fall as low as 6 to 7 cents a pound. The assumed production of 25 million pounds then would be valued at slightly more than 1½ million dollars a year. A price in the United States of 6 or 7 cents a pound for rayon producers' waste would operate to

discourage imports and they might become negligible or almost so, notwithstanding reduction of the duty from 10 percent to 5 percent *ad valorem*.

Duty increased by 50 percent.—An increase of 50 percent in the duty on raw wool, with the price of that material increased considerably, would create a tendency to use a large proportion of rayon waste in the manufacture of mixed wool and rayon fabrics. The average value of domestic rayon producers' waste then might rise to 12 or 13 cents a pound, and the production (assumed to be 25 million pounds) might be valued at about 3 million dollars a year. Imports, stimulated by the higher price of rayon waste in this country, might be about 3 million pounds having a foreign value of about \$360,000 a year. Despite the higher duty, imports might average about twice as much as in 1939 and be about 11 percent of consumption.

Per capita income 75 percent higher than in 1939.

As the result of the larger production of rayon expected at this level of income, the quantity of rayon waste becoming available from mills in the United States might be in the neighborhood of 28 million pounds a year, or about 120 percent greater than in 1939. With increased per capita spending power, activity in the wool-manufacturing industry, where nearly all of the rayon waste is consumed, may be 15-25 percent greater than if per capita income remained at the level of 1939. The proportion of pure wool, however, would tend to be greater and the proportion of rayon less, so that the net effect on the demand for rayon producers' waste probably would be slight. Total consumption of rayon waste might be about 10 to 12 percent greater by reason of increased income, and might be 29-31 million pounds. It is likely that the unit value of production in the United States and both the total quantity and total value of imports would be approximately the same as estimated previously when a per capita income at the 1939 level was assumed.

Duty as in 1939.—The assumed quantity of production (28 million pounds) might be valued at about 2.3 million dollars a year. Imports might be in the neighborhood of 1 million pounds with a foreign value of about \$80,000 a year. Consumption then would amount to about 29 million pounds, about 3 percent of which would be supplied by imports.

Duty reduced by 50 percent.—Because of the effect which a general reduction of duties would have on the price of raw wool, the average value of rayon producers' waste used for mixing with wool would be reduced, and the quantity assumed to be available from domestic mills (28 million pounds) might be valued at 1.7 million to 2 million dollars a year. As a result of the low average value of rayon waste in the United States, imports might become so small as to be virtually negligible.

Duty increased by 50 percent.—Because of higher raw-wool prices which would accompany an increase in the duty on that commodity, the demand for rayon producers' waste to mix with wool would expand, resulting in an increase in the average unit value of production. The domestic output, which, it is assumed, would be approximately 28 million pounds, might be valued at 3-4 million dollars a year. The relatively favorable market in this country for rayon waste would encourage imports, which might be about 3 million

pounds valued at \$360,000 a year, or about 10 percent of the estimated consumption.

Employment

As rayon waste is an incidental operational byproduct of the rayon industry, the number of employees allocated to its handling is small and in the post-war period would rise or decline proportionately with the output of rayon yarn and staple fiber and with the volume of waste collected.

RAYON STAPLE FIBER

Tariff paragraph: 1302.

Commodity: Filaments of rayon not exceeding 30 in. in length, other than waste.

Rate of duty: 25% ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	51,314	(1)	51,314	47,400	98,714	<i>Percent</i> 48
Value (\$1,000).....	13,519	(1)	13,519	9,016		
Unit value (per pound).....	\$0.26	(1)	\$0.26	\$0.19		
Persons employed (number).....	2,000	(1)				

¹ Export statistics not available; exports believed to be negligible.

² Foreign value.

³ Estimated.

Rayon staple fiber consists of short-length filaments suitable for processing on standard yarn-spinning equipment. Most of the rayon staple fiber is processed into so-called spun rayon yarn on cotton-spinning equipment. A smaller quantity is used for blending with other fibers in the manufacture of mixture fabrics in the wool and cotton industries. Yarns made wholly or partly of rayon staple fiber are consumed in the manufacture of apparel fabrics, and to a less extent, in the manufacture of blankets, rugs, and other fabrics for house furnishings.

World production (estimated) increased from 6 million pounds in 1930 to more than 1 billion pounds in 1939 and to more than 2 billion pounds in 1942. Germany, Japan, and Italy, in the order named, were the leading producers in 1939 and together accounted for nearly 90 percent of the world's output. The United States, with 5 percent of the total, ranked fifth.

The production of rayon staple fiber in the United States increased from less than 5 million pounds in 1935 to more than 50 million pounds in 1939. By 1942 the output was more than 150 million pounds. In the 2 following years the increase in production was relatively small, for the rayon industry concentrated on the manufacture of continuous filament yarns, a large proportion of which was required for the military program.

Plant expansion planned by producers in the United States, but held in abeyance during the war, includes a new viscose-staple-fiber plant capable of producing 100 million pounds of fiber a year and new acetate-staple-fiber facilities designed for an additional 50 million pounds. If, after the war, these installations are added, as seems probable, the capacity of the industry will be more than 300 million pounds, or more than twice as great as in 1942 and six times as great as in 1939.

Imports averaged about 50 percent of consumption during the pre-war decade. The growth of imports, which was rapid after the middle 1930's, did not keep pace with expansion of production. Over one-half of the imports in 1935-37 were obtained from Japan at an average foreign price of about 16 cents per pound. Unlike the rayon staple produced in the United States, which was confined largely to fine sizes and short lengths for use on the cotton system of spinning, the bulk of the imports from Japan were cut long and were irregular in size, length, and quality. They were used chiefly in the woolen and worsted industry. From 1938 to 1941 approximately 50 percent of the imports were supplied by the United Kingdom at an average foreign value of about 19 cents a pound. These imports consisted for the most part of staple fiber transferred by the leading British rayon producer to the account of a United States company (at that time its subsidiary), whose capacity then was inadequate for the growing domestic demand.

POST-WAR SHORT TERM

Consumption may be between two and three times greater than in 1939 and will be supplied largely by domestic production. The import trade in the early post-war period will be much smaller than in 1939, as the principal world producers (Germany, Japan, and Italy) will not have revived their trade with the United States. The United Kingdom will probably be the principal supplier, but its exports to the United States are not likely to be so large as before the war in view of the anticipated increase in demand from Empire areas and the probable expansion in the United Kingdom of consumption of staple fiber for manufacture into spun rayon fabrics.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The rayon industry will probably continue to widen its markets for staple fiber by improving quality, reducing costs, and developing new types with chemical and physical properties specifically adapted to special uses. Although prediction is difficult in this field, it is possible that the total consumption of rayon staple fiber, with income at the level of 1939, may be approximately 450 million pounds a year and may average about $4\frac{1}{2}$ times as much as in 1939.

In the past, as the quantity of production has increased, the average value has decreased; this trend toward lower prices might continue after the war but might be less pronounced. Viscose staple fiber might be valued at approximately 21 or 22 cents per pound, depending on the height of the duty; acetate staple fiber, about 32

or 33 cents; and the total output might average 24 or 25 cents.¹ This would be accompanied probably by a similar reduction in the average foreign value of staple fiber imported, which might range from 16 to 18 cents a pound under the various duty assumptions.

Duty as in 1939.—Domestic consumption has greatly expanded since 1939 and further enlargement of manufacturing capacity is planned; therefore, when imports again become available, they will probably represent a much smaller proportion of consumption than before the war. Imports might be slightly greater in volume than in 1939, and be in the neighborhood of 50 million pounds, having a foreign value of 8-9 million dollars a year. If these estimates should prove approximately correct, then the proportion of consumption supplied by imports would be about 11 percent. Production then might be about 400 million pounds valued at about 100 million dollars a year, or over seven times as great as in 1939.

Duty reduced by 50 percent.—With foreign values of imports averaging 18 cents per pound, or 5 percent less than in 1939, a duty of 12½ percent ad valorem would be equivalent to about 2 cents a pound, compared with 4 cents, the equivalent of the existing duty. A similar reduction of 2 cents in the average unit value of domestic production (say, from 25 to 23 cents a pound) might operate to prevent any expansion of imports as a result of the reduction in duty. It is assumed, however, that the average unit value of production would be reduced 1 cent a pound, instead of 2 cents, and that imports would accordingly increase. Imports might be 90-110 million pounds, having a foreign value of 16-20 million dollars a year, and average 20-25 percent of consumption. Assuming imports of this volume, production might then be 325-375 million pounds valued at 78-90 million dollars a year.

Duty increased by 50 percent.—This increase would tend to confine imports to types and grades not manufactured in this country on a large scale. Imports might consist of low-grade fiber like that received in the past from Japan, and small quantities of specialties from Europe, which, combined, possibly would average about 16 cents per pound. Possibly about 15 million pounds, having a foreign value of slightly less than 2½ million dollars, might be imported. This quantity would be about 3 percent of consumption. Domestic production, then, might amount to about 435 million pounds, valued at approximately 110 million dollars.

Per capita income 75 percent higher than in 1939.

Rayon staple fiber is not of itself a direct consumers' product; moreover, it is used largely in conjunction with other textile fibers in mixture goods. To the extent that staple fiber is used as a blending medium for styling and special utilitarian purposes, it will share in the expanded per capita consumption of cotton, woolen, and worsted fabrics and carpets and rugs. To the extent that it also is increasingly used in the production of fine all-spun rayon fabrics and novelties in the fashion fields, it will benefit by the higher proportion of consumers' income available for the purchase of better goods and semiluxuries. Finally, to the extent that it is used in the manufacture of cloth for popular-priced, volume-clothing lines, it will benefit by the rise in the

¹ This estimate for the total production is a weighted average, assuming acetate staple fiber to be 20 percent of the aggregate output, a larger proportion than in 1939.

general level of apparel consumption resulting from increased clothing budgets in the former low-income groups. Increased income will permit greater consumer outlays for textile home furnishings such as draperies, upholstery goods, and rugs in which staple fiber is used. Accordingly, consumption of rayon staple fiber might rise to about 550 million pounds. Inasmuch as increases in per capita income have had virtually no influence on the price of staple fiber in the past, it is assumed that there would be little, if any, price increase in this instance, and that the unit values of both production and imports would remain approximately as in 1939.

Duty as in 1939.—Imports of rayon staple fiber might be in the neighborhood of 60 million pounds, with a foreign value of about 10 million dollars. On this basis, they would constitute about 11 percent of consumption. Production, accordingly, might be about 490 million pounds, valued at close to 123 million dollars.

Duty reduced by 50 percent.—Imports might double as a result of a duty reduction and average possibly about 120 million pounds, with a foreign value of about 22 million dollars. If this increase were to occur, imports would supply over one-fifth of consumption; production probably then would be about 430 million pounds. At an assumed average unit price of 24 cents per pound, the value of the total domestic output would be about 103 million dollars.

Duty increased by 50 percent.—Imports would be reduced, and would amount possibly to 20 million pounds valued abroad at approximately 3 million dollars. Domestic production then would account for almost the entire supply and might amount to 520 million pounds valued at 130 million dollars a year.

Exports

Exports from the United States are small and are not separately recorded.

Employment

The number of persons engaged in the production of rayon staple fiber is not separately reported from the number engaged in the manufacture of rayon yarn and other allied products. The proportion of all employees in the industry which might have been allocated to this commodity in 1939 was possibly about 4 percent of the total, and the number so estimated about 2,000. Employment was probably twice as great in 1942, and after the war, on a long-term basis, it may be several times greater than in 1939. With higher consumer spending power, the further expanded production might increase employment by approximately 20 percent above what it would be if income remains at the 1939 level.

RAYON BROAD-WOVEN FABRICS OTHER THAN PILE

Tariff paragraph: 1306.

Commodity: Woven fabrics in the piece, wholly or in chief value of rayon or other synthetic textile.

Rate of duty: 45¢ per lb. and 45% ad valorem. *Equivalent ad valorem (1939):* 85%.

NOTE.—These fabrics are synthetic textiles produced from cellulose or with a cellulose base; they do not include nylon, vinyl resin fibers, or fibers made from protein substances. The rate fixed in the Tariff Act of 1930 was 45 cents per pound plus 60 percent ad valorem, and 10 percent ad valorem additional duty if Jacquard-figured. The rate was reduced to 45 cents plus 45 percent, whether or not Jacquard-figured, effective June 15, 1936, pursuant to the trade agreement with France.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	329,500	5,956	323,544	420	323,964	Percent (%)
Value (\$1,000).....	267,241	6,388	260,853	470		
Unit value (per pound).....	\$0.811	\$1.07	\$0.806	\$1.12		
Persons employed (number).....	69,745					

¹ Exclusive of velvets and estimated quantity of plushes not separately recorded.

² Weight includes other textile fibers (wool, cotton, or silk) employed as admixtures or blending media.

³ Less than 0.2 percent.

⁴ Foreign values.

In the compound duty on rayon fabrics, the specific rate of 45 cents a pound is intended as compensatory for the duty on rayon yarn. Actually, however, the difference between the price of the yarn in the United States and abroad in 1939 has been closer to 20 cents, on the average, than to 45 cents a pound. Inasmuch as the price of rayon yarn has fallen greatly since the enactment of the Tariff Act of 1930, the specific duty supplies a considerable margin of protection for the cloth-manufacturing process, in addition to that provided by the ad valorem duty of 45 percent. As applied to cloth manufactured from rayon staple fiber, which was not an important factor when the tariff act was passed, the specific duty was almost twice the average domestic price of the raw material in 1939 and probably was not far below the average value of the cloth produced in this country.

United States production of fabrics, wholly or predominantly of rayon by weight, increased from 43 million pounds in 1929 to 156 million in 1935 and to 330 million in 1939. During the war still further increases occurred, until in 1944 production, exclusive of rayon tire fabrics, was about 400 million pounds.¹ Much of this material, however, was manufactured for military purposes and for lend-lease and other export requirements. The supply for civilian use therefore was curtailed considerably.

¹ Domestic production of rayon tire cord and fabric increased from a relatively small quantity in 1939 to over 100 million pounds in 1944.

Imports of rayon fabrics have been only a very small fraction of 1 percent of production in the United States. In the thirties imports ranged from 193,000 pounds in 1931 to a record high of 1,041,000 pounds in 1937. Before 1936 imports were supplied principally by France, Germany, Switzerland, and Italy at a foreign value averaging between \$2 and \$3 a pound, or substantially higher than that of domestic fabrics. The imports from Europe consisted mainly of fabrics distinguished for novelty of weave, finish, or design. From 1936 to 1939 almost two-thirds of the imports were from Japan at an average foreign value of about 63 cents a pound. A considerable proportion of the imports from Japan consisted of grey-woven fabrics for finishing and reexport with draw-back in duty.

Before the war Japan was the world's largest exporter of rayon fabrics, attaining in 1936 a record export of 528 million square yards (over 100 million pounds) valued at 43 million dollars. Other large exporters were France and Italy.

POST-WAR SHORT TERM

A further expansion in the demand for rayon fabrics in the United States is expected from a continuation of past trends, from the need to replace inventories which have become depleted during the war, and from the expected shortage of all textile fabrics in the immediate post-war period. Production of all-rayon fabrics, together with mixtures and blends in chief weight of rayon may be increased to more than 500 million pounds and be about 60 percent greater than in 1939.

Imports probably will be very small as a result of difficulties in obtaining supplies abroad.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The consumption of rayon fabrics¹ and mixtures in chief weight of rayon may increase to 750-800 million pounds a year, or more than twice as much as in 1939. A substantially larger proportion of the fabrics produced in the post-war period will consist of spun-rayon fabrics made of yarns spun from staple fiber or from staple fiber blended with wool or cotton. Over 99 percent of the total consumption probably will continue to be supplied by production for domestic market whether the duty remains as in 1939 or is increased or decreased 50 percent. On the assumption that higher wages may be counterbalanced by improvements in technique of manufacture the average value of production may be about the same as in 1939, or 81 cents a pound. On this basis, the value of production for domestic market will possibly be 600-650 million dollars a year.

Duty as in 1939.—The imports might be substantially at the level of the peak year 1937, or 1 million pounds. At the average price prevailing in 1939, this volume of imports would have a foreign value of about 1 million dollars.

¹ Including fabrics wholly or in chief weight of all-filament rayon yarn, all-spun rayon yarn, or blended yarns and combination twists containing rayon.

Duty reduced by 50 percent.—Imports probably would be several times as great as in any previous year, but they still would be restricted to specialties and prestige goods sold in this country at unit values considerably above the average for domestic production. They might total 4–5 million pounds with a foreign value of 5–6 million dollars a year and represent close to 1 percent of the total domestic consumption.

Duty increased by 50 percent.—Imports might be about as in 1939, but less than in most other recent years. Possibly, they would amount to approximately 500,000 pounds valued abroad at \$500,000 or \$600,000.

Per capita income 75 percent higher than in 1939.

Consumption of fabrics wholly of rayon and mixtures predominantly rayon by weight might total 860–900 million pounds and average more than two and one-half times greater than in 1939 and about 14 percent greater than at the 1939 income level. It would consist of a substantial proportion of fabrics woven of combination yarns and blended spun-rayon yarns containing cotton and wool. All but a minor proportion probably would be supplied, as before, by domestic production. As the result of an increase in the general price level, the unit value of production might be about 92 cents a pound, or 13 percent higher than in 1939. The total value of production for domestic market then would be in the neighborhood of 800 million dollars a year.

The unit value of imports might be about 13 percent higher than in 1939, in keeping with the increase in the unit value of production. It would then be \$1.27 a pound, compared with \$1.12 in 1939. The estimates which follow are based on the further assumption that the quantity of imports would bear the same proportion to total consumption as at the lower level of income.

Duty as in 1939.—Imports might be about 1 million pounds, with foreign value of about 1½ million dollars.

Duty reduced by 50 percent.—Imports might be 10–15 times as great as in 1939, or 4–7 million pounds, valued abroad at 5–9 million dollars a year, but they still would represent a very small proportion (probably less than 1 percent) of consumption in the United States.

Duty increased by 50 percent.—Imports might amount to 500,000 or 700,000 pounds with a foreign value of \$650,000 to \$900,000 a year, and be little greater than the average before the war, despite the very considerable increase in the total consumption of rayon fabrics since that period.

Exports

In the years 1937–39 annual exports averaged about 4½ million pounds, valued at 5 million dollars. Cuba, the Philippine Islands, and Canada were the principal markets. During the war, exports increased to several times their former volume and consisted largely of spun-rayon fabrics. Mexico, Venezuela, and Central American countries became important customers. In the immediate post-war period, exports will probably continue close to their high wartime level. In the long term, exports will be affected by the probable increase in competition from European countries and Japan, which have lower manufacturing costs, and by the development of rayon weaving in countries which formerly were large importers of the fabric.

If United States products no longer are accorded the preferences enjoyed heretofore in Cuba and the Philippine Islands, exports may be reduced considerably, amounting to the average annual volume of 1937-39, valued at about 4.8 million dollars, with national income at the 1939 level and at about 5.4 million dollars, with income increased 75 percent.

Employment

Employment by textile mills in the manufacture of rayon fabrics will probably be increased after the war, although not to the same extent as production because of the adoption on a greater scale of improved types of automatic rayon looms. The number of workers may possibly be twice that in 1939, or in the neighborhood of 140,000. The level of employment will not be affected significantly by a decrease or an increase of 50 percent in the duty on rayon fabrics, inasmuch as imports will constitute only a small proportion of the total production under any of the above assumptions. Expansion of output as a result of increased consumer spending power might result in an additional 10 percent increase in employment.

RAYON VELVET RIBBONS (FAST-EDGE)

Tariff paragraph: 1307.

Commodity: Pile ribbons, wholly or in chief value of rayon or other synthetic textile.

NOTE.—These ribbons are synthetic textiles produced from cellulose or with a cellulose base; they do not include nylon, vinyl resin fibers, or fibers made from protein substances. The Tariff Act of 1930 provides rates of 45 cents per pound plus 60 percent ad valorem if the pile is wholly cut or wholly uncut, and 45 cents per pound plus 65 percent ad valorem if the pile is partly cut. These rates were reduced to 25 cents per pound plus 50 percent ad valorem, effective June 15, 1936, pursuant to trade agreement with France.

GENERAL

Below are data on United States imports in 1939, which were equivalent to apparent consumption:

Quantity (pounds).....	69, 325
Value.....	\$144, 942
Unit value (per pound).....	\$2. 09

¹ Foreign value.

Velvet ribbons are used for dress and millinery trimmings, beltings, hair ornaments, and other decorative accessories, the style for which has been dictated in the past by France. Rayon, silk, or cotton may be employed interchangeably for the pile and ground fabric. When rayon is used for the pile, the foundation cloth is usually either wholly or in part of cotton or silk. The fiber predominating in value varies in accordance with the cost and proportion of the constituent fibers used.

Two types of velvet ribbons are made—fast-edge and cut-edge. Fast-edge velvet ribbons are woven with selvages on narrow pile ribbon looms; cut-edge velvet ribbons are made by splitting wide velvet fabrics into strips and then gumming the edges to prevent fraying. Cut-edge ribbons can be made at low cost to greatly undersell fast-edge ribbons and are acceptable substitutes for most uses in the popular-price field. What is especially important in an article

subject to style changes, orders for cut-edge ribbons can be filled quickly in almost any desired width, color, or quality.

Domestic production of the fast-edge type of velvet ribbon was on a small scale before the middle 1920's. None were then made of rayon as synthetic fibers had not, up to that time, become adaptable for processing on pile fabric looms. The production of fast-edge velvet ribbons was abandoned because of the limited market, the spasmodic demand, the competitive position of the domestic industry, and the growth of the cut-edge velvet ribbon business. The extent to which cut-edge pile ribbons are produced in this country is not known. However, probably not over 5 percent of the volume of velvet fabrics manufactured by the domestic velvet industry is used for cutting into pile ribbons. The domestic production of rayon velvet fabrics suitable for such use amounted to 2,712,000 pounds in 1939. Although the value of all-rayon and rayon-mixed pile fabrics produced in that year is not available, the average unit value was probably considerably below the 1937 level of \$2 per pound.

Total imports of pile ribbons (both of rayon and of silk) decreased from approximately 150,000 pounds in 1931 to 12,500 pounds in 1935. Subsequently the trade increased, reaching 127,000 pounds in 1939. Imports of pile ribbons, in chief value of rayon which were less than 20 percent of the total before 1937, increased in 1939 to 54 percent of the total quantity. After the war it is expected that the volume of imports of rayon pile ribbons will probably constitute 80 or 90 percent of the total. The bulk of the imports have been supplied by France. Before 1935 the second largest source was Switzerland and in later years Japan.

Susceptibility of rayon pile ribbons to style changes makes the volume of imports highly unpredictable. In the estimates which follow, it is assumed that the popular demand for these ribbons will remain at the level in 1939, when fashion influences were relatively favorable. A large increase in per capita income would tend greatly to increase consumption provided the style demand continued strong. Should fashion trends in the post-war period favor tailored millinery and simplicity of dress, the reduction in demand for ornamental accessories would cause a sharp curtailment in imports of pile ribbons below the figures hereafter indicated.

POST-WAR SHORT TERM

Imports probably will be small, as the velvet ribbon mills abroad will not be restored to full production immediately.

POST-WAR LONG TERM

Consumption and Imports

Per capita income at 1939 level.

Duty as in 1939.—Per capita consumption of fast-edge pile ribbons of silk and of rayon combined may be about the same as in 1939, but of the total volume, possibly 85 percent (instead of 54 percent as in 1939) would be supplied by rayon ribbon. Imports of rayon pile ribbons then would be 100,000 to 150,000 pounds. The average foreign value of imports might remain about as in 1939, or about \$2 per pound. The total foreign value then would be \$200,000 to \$300,000 a year.

Duty reduced by 50 percent.—Consumption might increase considerably and imports be 120,000 to 180,000 pounds with a foreign value of \$240,000 to \$360,000 a year.

Duty increased by 50 percent.—Both consumption and imports probably would be less than if the duty had remained the same. Imports might be 80,000 to 120,000 pounds, with a foreign value of \$160,000 to \$240,000 a year.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—As the combined result of the increase in population and per capita income, and the displacement of silk pile ribbons by those of rayon, imports may be 150,000 to 250,000 pounds and average about three times as great as in 1939. It is assumed that the average foreign value of imports would increase to about the same extent as the general price level in the United States, or 13 percent. It then would be \$2.20 to \$2.50 per pound, and the total foreign value would be \$350,000 to \$600,000 a year.

Duty reduced by 50 percent.—Imports might be 200,000 to 300,000 pounds with a foreign value of \$450,000 to \$700,000 a year.

Duty increased by 50 percent.—Imports might be somewhat less than if the duty had remained the same, but they still might be 140,000 to 180,000 pounds with a foreign value of \$325,000 to \$425,000, and average 130 percent greater in quantity and 160 percent greater in value than in 1939.

KNIT RAYON GLOVES AND MITTENS

Tariff paragraph: 1309.

Commodity: Gloves and mittens, knit or crocheted, wholly or in chief value of rayon or other synthetic textile (not including embroidered).

Rate of duty: 45c lb. + 65%.

Equivalent ad valorem (1939): 77%.

NOTE.—"Other synthetic textile" as used in the tariff act is limited by definition (par. 1313) to those with a cellulose base; therefore, the classification under discussion does not include gloves of such fibers as nylon or vinyon. The rate of 45 cents per pound plus 65 percent ad valorem is that fixed in the Tariff Act of 1930. From April 16, 1938, to April 21, 1939, inclusive, the ad valorem portion of this rate was 50 percent on items in this classification valued at \$1.50 or more per dozen pairs, pursuant to the trade agreement with Czechoslovakia, which has been suspended.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 dozen pairs).....	2,344	(¹)	2,344	62	2,406	Percent 2.6
Value (\$1,000).....	12,502	(¹)	12,502	102		
Unit value (per dozen pairs).....	\$5.33	(¹)	\$5.33	\$1.64		
Persons employed (number).....	3,500					

¹ Export statistics not available; exports believed negligible.

² Foreign value.

³ Estimated.

The import classification covers gloves and mittens of rayon or other synthetic textiles made either of warp-knit or of circular-knit fabrics, and also those knit or crocheted directly from yarn, such as "string" glove styles or brushed rayon styles. Production data refer to rayon warp-knit fabric types only. Small amounts were probably made from circular-knit fabric or were knit direct from yarn and brushed.

The United States uses, annually, 2½-3 million dozen pairs of dress gloves made of textile materials other than wool. Although the total consumption varies comparatively little from year to year, the proportion of rayon gloves in the total and the ratio supplied by imports has changed significantly. For many years the United States market for dress gloves of textile materials was preempted by cotton warp-knit fabric gloves imported from Germany. After 1934, however, this trade was hampered by the United States consumer boycott against German goods and by exchange difficulties. American buyers sought fabric gloves of any materials wherever they were to be found. This situation led to Czechoslovakia becoming the principal source of cotton warp-knit fabric gloves, while domestic manufacturers responded with quantity production of rayon gloves. The new market for rayon gloves stimulated their importation from Germany and Czechoslovakia. Imports were over 400,000 dozen pairs a year in 1936 and 1937 and represented nearly one-fourth the total supply of rayon gloves. They had dwindled to 62,000 dozen pairs (43 percent from Japan) by 1939, both because of the increased domestic production and because of the absorption of Czechoslovakia by Germany.

Domestic production of rayon fabric gloves reached a maximum of over 2¼ million dozen pairs in 1939. Output declined in subsequent years, in part because of scarcity of rayon yarn and the scarcity of labor, but also because of increasing production of cotton warp-knit fabric gloves. In 1939 rayon gloves made up 94 percent of the total output of rayon and cotton dress gloves;¹ in 1943, they made up 60 percent.

POST-WAR SHORT TERM

Demand will probably continue at a high level. The domestic industry may well produce at capacity. Imports probably will not be obtainable for some time because of conditions created by the war in the countries from which almost the entire supplies were obtained.

POST-WAR LONG TERM

Consumption, Production, and Imports

The market for dress gloves of textile materials has undergone little fluctuation with changes in per capita income because, in times of low income, demand is sustained by shifts from the more costly leather gloves. The total demand for textile dress gloves might be 3¼-4 million dozen pairs if per capita income remains the same as in 1939, and it might increase to 5¼-6 million dozen pairs if per capita income is increased 75 percent, as such a substantial addition to income would

¹ Cotton gloves here included are cotton warp-knit fabric gloves only.

probably mean new customers and an increase in the number of gloves in the wardrobes of consumers.

As cotton warp-knit fabric gloves are generally preferred to rayon fabric gloves, the demand for rayon gloves goes down as the supply of dress cotton gloves increases, and vice versa, except when particular styles, as for example a vogue for long or elaborately trimmed gloves, give special consumer appeal to rayon fabric gloves. In this discussion the prices are based on the assumption that short gloves will be the prevailing mode. It is assumed that most of the total will again be supplied by cotton gloves, and that if the duties are reduced by 50 percent, the imports of cotton gloves will increase considerably, with the result that there will be only a moderate increase in the imports of rayon gloves and a considerable decline in the production of them.

Actually, technical processes still on the threshold of development may alter radically the competitive position of gloves manufactured from rayon. Nylon and vinyon already have been used in glove fabric, and with their quick-drying properties (especially desirable in wash gloves) these or unknown synthetic fibers may assume a dominant position over rayon and cotton.

The following estimates are based on the assumption that production in Germany and Czechoslovakia of cotton warp-knit fabric gloves will be resumed.

Per capita income at 1939 level.

Duty as in 1939.—Upon the assumption that cotton gloves will again be available in adequate quantities, the consumption of rayon gloves might be 20 to 40 percent less than in 1939, or 1½–2 million dozen pairs a year. Imports, because of developments in foreign rayon industries, would probably be as large, or larger, than in the 2 highest pre-war years. They might be 400,000–600,000 dozen pairs a year, or about 30 percent of consumption. It is expected that the average price will exceed that of 1939, which was unusually low. Thus, the foreign value might be in the neighborhood of \$800,000 to \$1,200,000. Production might be 1–1½ million dozen pairs. Assuming domestic costs a little above those of 1939, the total value of production would be 6–8½ million dollars, or 30–50 percent less than in that year.

Duty reduced by 50 percent.—The proportion of the market for textile dress gloves which was supplied by those of cotton warp-knit fabric (on which the duty also would be reduced) would probably increase further, and the consumption of rayon gloves might decline to 1–1½ million dozen pairs. Imports of rayon gloves would possibly increase to as much as 600,000 dozen to 1 million dozen pairs, or about 60 percent of consumption. As all grades would probably share in this increase, the average foreign price might be about the same as if the duty remained at the 1939 level. The total foreign value then would be 1½–2 million dollars. Production, adversely affected by increased imports of cotton, as well as of rayon gloves, might decline to 400,000–600,000 dozen pairs. The average value of production also would be reduced and the total value might be only 2¼–3½ million dollars a year, or 50–70 percent less than if the duty had remained unchanged.

Duty increased by 50 percent.—Consumption might be $1\frac{1}{2}$ –2 million dozen pairs, or about the same as if there had been no change in duty. Only a very small part, however, would be supplied by imports, perhaps about 50,000 dozen pairs, or about 5 percent of consumption. As imports would probably be confined to specialties, the unit value might be greatly increased, so that the total foreign value might be between \$150,000 and \$200,000 a year. Domestic production would probably be $1\frac{1}{2}$ –2 million dozen pairs. Assuming an average price about 10 percent above that of 1939, the total value of production would be 9–12 million dollars.

Per capita income 75 percent higher than in 1939

Duty as in 1939.—Consumption would, perhaps, be $2\frac{1}{2}$ – $3\frac{1}{4}$ million dozen pairs. Of this amount imports might supply between 600,000 dozen and 1 million dozen pairs, or about 30 percent of consumption. As the result of higher prices and higher average quality, the average foreign value of imports might be almost 40 percent greater than in 1939, or \$2.25 per dozen pairs. The total foreign value of imports then would be 1.3–2.2 million dollars. Production would, perhaps, be $1\frac{1}{2}$ – $2\frac{1}{2}$ million dozen pairs. The average value of production might well be 25 percent greater than in 1939, or \$6.50 a dozen pairs. The total value of production then would be 10–17 million dollars.

Duty reduced by 50 percent.—Consumption would possibly be $1\frac{1}{2}$ – $2\frac{1}{4}$ million dozen pairs. Imports would probably supply an increased share, perhaps 1 – $1\frac{1}{2}$ million dozen pairs, or about 60 percent of consumption. The average price would be about the same as if the duty had not been changed, and the total foreign value would possibly be from $2\frac{1}{2}$ – $3\frac{1}{4}$ million dollars. Production would probably be far below the 1939 level, because of competition from imported cotton and imported rayon gloves. It might total 700,000 dozen to 825,000 dozen pairs. Assuming prices about 20 percent above the 1939 level, the total value of production then would be $4\frac{1}{2}$ – $5\frac{1}{4}$ million dollars.

Duty increased by 50 percent.—Consumption might be about the same as if the duty remained unchanged, or $2\frac{1}{2}$ – $3\frac{1}{4}$ million dozen pairs. Imports would be small, possibly 50,000–100,000 dozen pairs, or about 5 percent of consumption. They would be confined to specialties, of which the average foreign value might be $2\frac{1}{2}$ times as great as in 1939 or \$4 per dozen pairs. The total foreign value of imports then would be between \$200,000 and \$400,000. Production might be $2\frac{1}{4}$ – $3\frac{1}{2}$ million dozen pairs. Assuming an average price about 25 percent above that of 1939, or \$6.70 per dozen pairs, the total value of production would be 15–23 million dollars.

Exports

Exports are not separately recorded, but are believed to be negligible. It is unlikely that conditions under the various assumptions would cause any increase in exports.

Employment

As cotton dress gloves again become available, employment in the manufacture of rayon gloves probably will decline. At the same rates of duty the number of persons employed may be 50 percent less than

in 1939, or about 1,750 if per capita income remains the same, and it may be about 15 percent less, or not less than 3,000 if per capita income is 75 percent greater than in 1939.

A reduction of 50 percent in the rates of duty might cause employment in the manufacture of rayon gloves to be reduced 60 percent, chiefly because of larger imports of cotton gloves, upon which the duties also would be reduced. An increase of 50 percent in the duties might cause employment to be 30 percent greater than if they had been unchanged. Except under the last assumption, however, the persons employed would probably be less than in 1939.

SCHEDULE 14. PAPERS AND BOOKS, AND RELATED ITEMS PROVIDED FOR IN THE FREE LIST

INTRODUCTION AND SUMMARY

All items in schedule 14 and related items on the free list of which the imports in 1939 exceeded \$100,000 are embraced in this section, except the basket and special import classifications listed below:

Commodity	Tariff paragraph	Tariff status	Value of imports, 1939
Manufactures of paper, n. e. s.	1413	Dutiable	\$509, 998
Books, maps, music, engravings, photographs, etchings, lithographic prints, and charts printed more than 20 years, and publications of scientific and literary associations, or academies, or foreign governments.	1629	Free	2, 140, 563
Books, maps, music, engravings, etchings, prints, and charts imported for educational or religious purposes, or the encouragement of the fine arts, or any college, academy, school, or seminary of learning in the United States, or any state or public library, and not for sale.	1631	do	421, 477
Stamps, foreign, postage or revenue, and foreign government stamped envelopes or post cards bearing no other printing than the official imprint thereon.	1771	do	708, 917
Total			3, 780, 955

These classifications cover many unrelated items which are subject to different influences or to special conditions governing their importation, such as age, publication by associations or governments, foreign stamps, and printed matter for the use of institutions and not for sale. With respect to them it would be impracticable to say anything significant concerning the effects of changed conditions on consumption, production, imports, or exports.

The total number of dutiable, or mixed dutiable and free, items for which reports are presented under schedule 14 is 18; the largest of these, books, etc., is a combination of related articles, of which about half of the imports enter duty-free. The total value of the imports of these 18 items in 1939 was 11.5 million dollars. The coverage of the dutiable items in this schedule is over 85 percent. Cigarette paper, of which imports amounted to 3.9 million dollars in 1939, is not here included but is treated in schedule 15.

In addition to the dutiable items, the reports which follow include 6 duty-free items of major importance which are related to the dutiable items; one major article which is related to paper, namely pulpwood, is not here included but is treated in connection with schedule 4, which covers wood and manufactures thereof. The major free items included are paper-making materials—namely wood pulp, rags for paper stock, and waste (other than rags) for paper stock—together with standard newsprint paper and newspapers and

periodicals. The total value of the imports of the 6 items in 1939 was 195.5 million dollars, of which newsprint paper accounted for about 60 percent and wood pulp for about 38 percent.

Articles dutiable under schedule 14 and the related duty-free items, naturally fall into two great groups, namely printed matter, and other articles, the latter including certain paper materials, various kinds of paper, and manufactures of paper other than printed matter. The table below compares actual production (for the domestic market) and actual imports in 1939 with corresponding estimates for these two groups of articles, distinguishing the dutiable from the free, under the several assumptions as to national income and levels of duty:

Period, income level, and tariff treatment	Production for the domestic market		Imports	
	Value	Ratio to 1939	Foreign value	Ratio to 1939
	<i>Million dollars</i>	<i>Percent</i>	<i>Million dollars</i>	<i>Percent</i>
1939:				
<i>Papers and books, dutiable</i>				
Printed matter.....	744.1	100	4.2	100
Other dutiable (except printed matter).....	769.6	100	7.3	100
Post-war long term:				
Per capita national income same as in 1939:				
Printed matter:				
Duty as in 1939.....	860.4	116	5.3	120
Duty reduced 50 percent.....	860.4	116	5.8	132
Duty increased 50 percent.....	860.4	116	4.7	107
Other dutiable (except printed matter):				
Duty as in 1939.....	956.0	124	9.0	123
Duty reduced 50 percent.....	955.4	124	11.1	152
Duty increased 50 percent.....	957.6	124	5.9	80
Per capita national income 75 percent higher than in 1939:				
Printed matter:				
Duty as in 1939.....	1,194.5	161	8.3	189
Duty reduced 50 percent.....	1,194.5	161	9.2	208
Duty increased 50 percent.....	1,194.5	161	7.4	167
Other dutiable (except printed matter):				
Duty as in 1939.....	1,381.1	179	13.2	180
Duty reduced 50 percent.....	1,380.1	179	16.7	228
Duty increased 50 percent.....	1,383.0	180	8.8	120
1939:				
<i>Papers and books, free</i>				
Printed matter.....	1,248.3	100	.6	100
Other free (except printed matter).....	319.5	100	194.9	100
Post-war long term:				
Per capita national income same as in 1939:				
Printed matter.....	1,399.1	112	.8	120
Other free (except printed matter).....	397.9	125	214.6	110
Per capita national income 75 percent higher than in 1939:				
Printed matter.....	1,699.1	136	.9	140
Other free (except printed matter).....	611.5	191	306.6	157

¹ Includes imports of books, pamphlets, etc., free of duty, valued at \$1,648,000.

Imports of duty-free printed matter are insignificant; the principal item consists of newspapers and periodicals, and it is only natural that imports of these should be very small compared with domestic production. The high ratio of imports to production for duty-free paper and pulp reflects the immense requirements of the United States for white paper, and the depletion of the domestic stands of timber of species hitherto considered suitable for the manufacture of such paper (principally spruce and balsam fir). As pointed out in

the discussion of newsprint paper, it is possible that in the future there may be greater resort to Southern pine, a relatively abundant raw material, for the production of newsprint.

It is estimated that, even with no increase in national income, the value of domestic production of the duty-free items related to schedule 14 in the long-term post-war period will probably exceed the value in 1939 by a percentage greater than that of population growth. The estimates indicate the probability that, if per capita income were 75 percent higher than in 1939, domestic production and imports of duty-free printed matter would be about 20 percent greater, in terms of value, than with no change in income, whereas both production and imports of the other free articles (principally newsprint and wood pulp) would be over 50 percent greater at the high income level.

As pointed out in the general introduction, the summary estimates in the above table are subject to an appreciable margin of error, notwithstanding the tendency of errors in the estimates for the individual items to offset one another. The number of dutiable items is fairly large so that the offsetting of errors may result in fairly accurate totals. The duty-free items, however, are dominated by two articles in imports, namely newsprint paper and wood pulp, the errors in the estimates for which might readily be in the same direction, making the possible margin of error in the combined estimates of post-war imports fairly large. So too, the dominance of newspapers and periodicals in the figures for domestic production of duty-free articles makes possible a considerable margin of error in the group totals for free items.

In 1939 the combined production (for the domestic market) of the 18 dutiable items covered by this section amounted to 1,514 million dollars, and imports amounted to 11.7 million. The ratio of imports to production was equal to about 0.8 percent; this ratio is somewhat understated by reason of duplication of values in the production data. Production of the 6 related free items was 1,568 million dollars, and the imports were 195.5 million dollars, or a ratio of imports to domestic production of about 12 percent. However, excluding newspapers and periodicals, imports of which are, by the nature of the commodity, very small compared with the domestic production, the combined production of these free items was 319 million dollars, a figure which involves much duplication of pulp and paper, whereas the value of the imports was 194.8 million. Imports of newsprint paper greatly exceed production, and imports of wood pulp in 1939 were equal to more than 35 percent of production.

Since imports of both the groups which are dutiable under schedule 14 are very small in proportion to production, a decrease or an increase of 50 percent in the rates of duty would have virtually no effect upon the value of domestic production. Moreover, according to these estimates, the percentage increase or decrease in the value of imports which would result from such changes in duties would probably be comparatively small, as regards both printed matter and other articles dutiable under schedule 14.

As to both groups of articles dutiable under schedule 14 it is estimated that, even with no increase in per capita income, the value of production for the domestic market (which is nearly the same thing as the

total consumption) in the post-war period would exceed that in 1939 by considerably more than the increase in population. The estimates also indicate the probability that, with respect to both groups, the value of production for the domestic market would be about 40 percent greater under the assumed high income level than with no change in income.

It would not, of course, be expected that imports of printed matter now subject to duty would be large even if the articles should be transferred to the free list. As regards dutiable papers, the United States is in a favorable position to compete with foreign countries; it has, on the whole, adequate supplies of materials for these classes of paper, and the enormous consumption makes possible the use of mass-production methods resulting in relatively low costs. The tariff rates on dutiable paper (excluding cigarette paper) are relatively moderate, averaging about 20 percent ad valorem in 1939, as weighted by the imports under the several rates in that year.

UNCOATED BOOK AND PRINTING PAPER

Tariff paragraph: 1401.

Commodity: Uncoated book and
printing paper, n. s.
p. f.

Rate of duty: $\frac{1}{2}$ ¢ per lb., plus 5 per- *Equivalent ad valorem* (1939): 13
cent ad val. percent.

Note.—The rate of $\frac{1}{4}$ cent per pound plus 10 percent ad valorem, imposed by the Tariff Act of 1930, was changed to the rate shown above pursuant to the trade agreement with Canada, effective January 1, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 short tons).....	2,087	15	2,072	13	2,085	Percent 0.6
Value (\$1,000).....	175,029	1,831	173,198	1,730		
Unit value (short ton).....	\$83.86	\$119.00		\$54.42		
Persons employed (number).....	18,000					

¹ Foreign value.

² Estimated. Includes pulp mill, laboratory, and office employees.

Uncoated book and printing papers include two distinct types used in printing books, magazines, pamphlets, advertising material, and other printed matter. These are (1) ground wood printing and specialty papers, containing principally ground wood, and (2) book papers, containing, principally, chemical wood pulp, rag pulp, or both.

Book papers have generally accounted for about 75 to 90 percent of the total. The average unit value is about 50 percent higher than that of ground wood printing papers.

Ground wood printing papers are used largely by publishers of pamphlets and periodicals having no illustrations, and by job printers. Uncoated book paper is used by printers and publishers of books, pamphlets, music, illustrated periodicals and news magazines, high-class advertising matter with or without illustrations, and by commercial printers generally.

Consumption of uncoated printing and book papers was increasing, though irregularly, before the war; it averaged about 1.6 million tons from 1929 to 1934, about 1.8 million tons from 1935 to 1939, and about 2.3 million tons from 1940 to 1944. Imports averaged about 2,000 tons annually from 1929 to 1934, approximately 11,000 tons from 1935 to 1939, and 25,000 tons from 1940 to 1944. Imports have ranged from one-tenth of 1 percent to 1.2 percent of total estimated consumption. Ground wood printing papers have usually constituted from 85 to 95 percent of total imports; imports of the higher grades of book paper have been small. The difference in quality accounts for part of the difference in unit value between domestic production and imports. Exports averaged about 12,000 tons a year from 1929 to 1939, but increased to about 22,000 tons in the following 3 years. The higher grades of book paper accounted for practically all of the exports.

Increased competition of radio and newspaper advertising with that in periodicals may eventually reduce consumption of book papers. The estimates in the following sections, however, are based on the assumption that the competitive relation of these various advertising media will be substantially the same as in pre-war years.

POST-WAR SHORT TERM

Greater interest in world events, broader educational activities, and the expansion of advertising programs in the period immediately following the war will be likely to increase the consumption and production of uncoated book and printing papers considerably above the 1939 level. Imports may be somewhere between the 1939 and 1943 levels in quantity, but the unit values will be higher. Exports from the United States, competing with papers made in other countries again able to resume full production schedules, may be only slightly higher than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Assuming a continuation of the pre-war trend in the use of these types of paper, and taking account of population growth, consumption may amount to about 2.5 million tons, an increase of 20 percent over 1939. Although imports may increase at a higher rate than consumption, they will probably continue to be less than 1 percent of consumption. Domestic production, including small exports, will, therefore, be approximately 2.5 million tons valued, with prices at the 1939 level, at about 210 million dollars. Changes in imports resulting from changes of 50 percent in the rate of duty, would affect production but little.

Duty as in 1939.—Assuming a continuation of the pre-war trend in imports, the amount entered might be about 40 percent greater than in 1939, or about 18,000 tons, with a foreign value of approximately \$980,000.

Duty reduced by 50 percent.—Imports might be about one-sixth greater than with the duty as in 1939, amounting to about 21,000 tons, with a foreign value of about 1.1 million dollars.

Duty increased by 50 percent.—Imports might be around 16,000 tons with a foreign value of around \$870,000.

Per capita income 75 percent higher than in 1939.

Production and consumption of these papers might reach 3.5 million tons, about 40 percent greater than with income as in 1939. With prices about 15 percent higher, the value of production might be roughly 340 million dollars.

Duty as in 1939.—Imports might be 24,000 tons (one-third more than on the lower income assumption), with a foreign value of approximately 1.5 million dollars.

Duty reduced by 50 percent.—Imports might be roughly 28,000 tons, and might be valued at 1.8 million dollars (foreign value).

Duty increased by 50 percent.—At this duty level imports might be about 22,000 tons, valued at 1.4 million dollars foreign value.

Exports

Exports of uncoated book paper will probably not greatly exceed those of 1939, primarily because of increased domestic requirements. These exports will probably be limited almost entirely to higher grade book papers at a unit value twice that of imports. If the income level is about the same as in 1939, exports might probably be about the same in volume and value as in that year. At the higher level of income, exports might be about 18,000 tons, valued at 2.5 million dollars.

Employment

The number of persons employed would probably be about 18,500 on the basis of the 1939 level of income, and about 24,000 on the basis of the higher income level. These estimates are based on the assumption that proportions of ground wood printing paper and uncoated book paper produced will be the same as in 1939. A substantial increase in the percentage of ground wood papers would probably result in slightly higher employment.

PULPBOARD IN ROLLS, WALLBOARD, AND INSULATING BOARD

Tariff paragraphs: 1402 and 1413.

Commodity: Pulpboard in rolls, wallboard, and insulating board.

Rate of duty: Pulpboard in rolls for use in the manufacture of wallboard, not surface stained or dyed, lined or vat lined, embossed or printed, 5% ad val.

Pulpboard in rolls for use in the manufacture of wallboard, surface stained or dyed, lined or vat lined, embossed or printed, 15% ad val.

Insulating board, 10% ad val.

Wallboard, n. s. p. f., not laminated, 10% ad val.

NOTE.—The rate fixed in the Tariff Act of 1930 on pulpboard in rolls for use in the manufacture of wallboard was 10 percent ad valorem if not surface stained, dyed, etc., and 30 percent ad valorem if surface stained, dyed, etc. The rate on the former was reduced to 5 percent, effective January 1, 1936, pursuant to the trade agreement with Canada; the rate on the latter was reduced to \$14.50 per short ton but not less than 15 percent nor more than 30 percent ad valorem, effective August 5, 1935, pursuant to the trade agreement with Sweden, but since January 1, 1936, the rate has been 15 percent ad valorem pursuant to the agreement with Canada.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (short tons).....	463,701	21,484	442,217	15,935	468,152	<i>Percent</i> 3.5
Value (\$1,000).....	31,528	2,083	29,445	1,633		
Unit value (per short ton).....	\$67.99	\$96.96	\$66.59	\$39.75		
Persons employed (number).....	4,500					

¹ Foreign value.

² Estimated.

The pulpboard, wallboard, and insulating board covered by this report is made of wood or other vegetable fibers, as distinguished from wallboard made of mineral substances. The pulpboard in rolls is used for conversion into wallboard, which is a dense, rigid board commonly used in the construction of interior partitions, ceilings, and side walls, and for many other purposes. Insulating board is made of the same raw material but is not compressed as is wallboard; the open cellular structure provides insulation against heat, cold, and sound. Nearly two-thirds of the total quantity of imports in 1939 consisted of pulpboard in rolls, which came solely from Canada. All this imported pulpboard enters one of the New York Customs districts and is very important to one section of the domestic industry. Of the remainder of the 1939 imports about two-thirds was insulating board and one-third wallboard; practically all imports of these two types came from Sweden. Pulpboard in rolls for manufacture into wallboard is a semimanufactured material and is a lower priced product than wallboard; the unit value of the total imports of this group is thus influenced by the large proportion of pulpboard, and is considerably lower than that of domestic production or of exports.

Exports of domestic wallboard and insulating board are widely distributed throughout the world. In 1939 exports of insulating board were twice as large as those of wallboard. Although a world-wide reduction of trade barriers might increase the United States foreign trade in these commodities, it is unlikely that, even with a reduction of 50 percent in the rates of duty (United States or foreign), either imports or exports would become a substantially larger proportion of the domestic consumption and production of these articles than in 1939.

POST-WAR SHORT TERM

United States production of wallboard and insulating board will probably be substantially greater in the immediate post-war years than in 1939 because of the prospective large building program. It is estimated that several million dwelling units may be built within a few years after the close of the war. The volume of house construction and the growing use of wallboard and insulating board may result in a greatly increased consumption of these commodities. In addition, shortages of lumber and other building materials may promote an even greater increase in consumption of these boards. Exports in heavier volume are also possible in view of the requirements for building materials in European countries to repair the heavy damage created by war. Imports of wallboard and insulating board, on the other hand, are unlikely to exceed and will possibly be considerably less than in the late pre-war years inasmuch as the Swedish, Norwegian, and Finnish mills will find considerable demand and less competitive markets in Western European countries than in the United States.

The importation of pulpboard in rolls from Canada may or may not increase more or less proportionally to the increase in consumption of wallboard and insulating board.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

With a normal expansion of old uses and the development of new ones, together with increase in population, consumption may reach 600,000 tons, or about 30 percent more than in 1939. Prices may be about 20 percent above those of 1939, averaging for the domestic product about \$81.50 per ton. Because of the advantage possessed by the domestic producers in meeting specific requirements in some manufacturing lines, domestic production may, even if duties remain as in 1939, supply a slightly larger proportion of total consumption than in the pre-war years. Under these conditions the domestic output, excluding exports, may reach 580,000 tons, valued at approximately 47 million dollars. Owing to the fact that imports constitute such a small part of total consumption, variations in imports brought about by changes in the rate of duty would probably have only slight effect on domestic production.

Duty as in 1939.—Imports might be about 25 percent more than in 1939, or approximately 20,000 tons, with a foreign value of about 1 million dollars.

Duty reduced by 50 percent.—Although the average rate of duty on these articles in 1939 was slightly less than 10 percent, halving of the duty might result in imports around 20 percent greater than with unchanged duty or, say, a total of 24,000 tons and 1.2 million dollars in foreign value.

Duty increased by 50 percent.—A higher duty might have the effect of curtailing imports, more particularly those from European sources where ocean freight rates are a factor. The total might be about the same as in 1939, or 16,000 tons, with a total foreign value of \$765,000.

Per capita income 75 percent higher than in 1939.

Greater activity in construction and manufacturing industries utilizing wallboard and insulating board might result in a consumption about one-third greater than that with income as in 1939, or about 800,000 tons. As a result of the greater demand and rising costs of labor and material, unit values might be as much as 10 percent higher than with income as in 1939, or about \$90 per ton. Domestic production, not including exports, therefore, would be about 775,000 tons, valued at approximately 70 million dollars. Variations in the amount imported would have very little effect on the volume of production.

Duty as in 1939.—Imports might be about 25 percent more than with income as in 1939, or about 25,000 tons with a foreign value of approximately \$1,300,000.

Duty reduced by 50 percent.—Imports might approximate 30,000 tons and have a total foreign value of about \$1,575,000.

Duty increased by 50 percent.—Imports might not exceed 20,000 tons, with a foreign value of \$1,100,000.

Exports

In the long-term period with income at the 1939 level, exports might be about 25,000 tons, valued in the neighborhood of \$2,900,000. At the higher income level exports of domestic wallboard and insulating board which already have world-wide distribution would doubtlessly share in global prosperity. The larger markets for these products in the immediate pre-war years included Canada, the United Kingdom, Philippine Islands, Australia, Union of South Africa, Argentina, Mexico, and the Netherlands. None of these countries with the exception of Canada have suitable raw materials in sufficient quantity to warrant the establishment of wallboard and insulating board industries on a large scale. Some of the other countries to which American exports are made may possibly have the necessary raw materials, but their respective individual consumption would not justify the setting up of an industry. Under these circumstances it is quite possible that exports may reach 32,000 tons annually, 150 percent of the 1939 volume exported, with a value of around \$3,875,000.

Employment

The number of wage earners in the industry in 1939 is estimated at 4,500. With a largely increased output, this number might be increased to a total of 7,500.

PAPERBOARD AND FIBERBOARD

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
	Paperboard and pulpboard, including cardboard and leatherboard:		
1402	Not plate-finished, supercalendered or friction calendered, laminated, coated, etc.	10% ad val.	10%.
1413	Plate-finished, supercalendered or friction calendered, laminated, coated, etc.	\$14.50 per short ton but not less than 15% nor more than 30% ad val.	25%.
1413	Paperboard, pulpboard, cardboard, and leatherboard, embossed, cut, die-cut or stamped into designs or shapes, etc.	30% ad val.	30%.
1413	Test or container board	20% ad val.	20%.
1413	Press board or press paper	30% ad val.	30%.
	Average		13%.

NOTE.—The above rates are those fixed in the Tariff Act of 1930 except in the case of paper, pulp, card, and leather board, plate finished, supercalendered, etc., which were dutiable under the 1930 Tariff Act at 30 percent ad valorem. The rate of \$14.50 per short ton, but not less than 15 nor more than 30 percent ad valorem was made effective August 5, 1935, pursuant to the Swedish trade agreement.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (short tons).....	5,910,989	73,272	5,837,717	12,482	5,850,199	Percent 0.2
Value (\$1,000).....	234,034	3,895	230,139	1,547		
Unit value (per short ton).....	\$39.59	\$53.16	\$39.42	\$43.82		
Persons employed (number).....	8,000					

¹ Foreign value.

² Estimated.

The board covered by this classification includes both that manufactured wholly from wood pulp and that made from various proportions of wood pulp combined with waste paper. Other types of board, such as wallboard, insulating board, and pulpboard in rolls, for use in the manufacture of wallboard, and made from similar raw materials, are considered in a separate section. The bulk of the board is fabricated into boxes and cartons, although much of it has special uses, indicated by name, such as automobile, binder, button, counter, egg-case filler, match, panel, pattern, press, shirt, and tag board.

About 60 percent of the imports consists of pulpboard, 12 percent of leatherboard going into the manufacture of shoes, 13 percent of nonprocessed specialty board, and 15 percent of specialty boards which have been processed in some manner; for example, calendered, coated, lined, dyed, or printed. United States production of prac-

tically all of the types of board that are imported greatly exceeds imports. More than one-half the 1939 imports (in quantity) came from Finland, about 20 percent from Canada, and 15 percent from Sweden.

United States exports in the pre-war period went chiefly to the United Kingdom, Mexico, South Africa, Cuba, and Canada. Approximately three-fifths of the exports in 1939 was kraft container board, one-fifth boxboard, and one-fifth specialty board. In pre-war years there was a trend toward the establishment of paperboard mills in countries heretofore without this industry and this development is likely to continue after the war.

The level of trade barriers here and abroad might affect only to a limited extent the volume of imports and exports of paperboard and fiberboard, although foreign trade may be a factor of considerable importance to certain small sections of the industry. It is unlikely, however, that imports would supply a substantial part of domestic consumption of these materials under any level of duties considered in this section. It is likewise not likely that exports will become a major outlet for domestic production.

POST-WAR SHORT TERM

United States production of board will in all probability be considerably larger than in the immediate pre-war years to meet requirements of domestic consumers and for export. Although the annual output has been substantially greater in each of the war years than in 1939, the actual tonnage allocated to other than strictly war uses is comparatively small. Consumers have economized in the use of board in packaging by eliminating the smaller units from their manufactured goods, by using lighter weight boxes and cartons, and by eliminating display cards for their products. Resumption of packaging on the pre-war scale and replacement of stocks will doubtless greatly increase the consumption of board. Exports, too, are likely to be substantially greater because during the war foreign consumers have been able to obtain only meager supplies of board from the United States and practically none from European sources. On the other hand, imports into the United States from Finland and other countries in Europe will probably be much smaller than before the war because of the necessity of restarting mills, and the European markets will be less competitive than the United States market.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

By reason of increase in population, consumption of fiber and paperboard will possibly be around 6.4 million tons, or about 10 percent greater than in the immediate pre-war years. Production, including exports, may be 10 percent larger than in 1939, or may reach a volume of 6.5 million tons; because of an expected general increase in the prices of pulpwood and pulp, unit values are also likely to increase by about 10 percent, which would bring the aggregate value of production to approximately 285 million dollars. Production for the domestic market would in that case be about 6.4 million tons, with

a value of about 280 million dollars. Because imports are so small a part of total consumption, changes in the amount entered as a result of changes in the duty would have very little effect upon domestic production.

Duty as in 1939.—United States imports may not exceed 13,000 tons, or about 5 percent more than in 1939. Allowing for a 10-percent increase in unit value, the total foreign value of imports would amount to about \$625,000.

Duty reduced by 50 percent.—A lower rate might increase imports by about 10 percent over those with the duty unchanged, or to 14,500 tons, with a total foreign value of \$700,000.

Duty increased by 50 percent.—Heavier duties might reduce imports by about 50 percent compared with the duty as in 1939, or to about 6,300 tons, with a total foreign value of \$300,000.

Per capita income 75 percent higher than in 1939.

Under the stimulus of a much higher per-capita income consumption of fiber and paperboard might approximate 8 million tons, or 25 percent more than with income as in 1939. Prices might reach a level about 20 percent higher than in 1939. Domestic production, including exports, would probably be about 8.1 million tons, with a value of 385 million dollars.

Duty as in 1939.—With an increase in per capita income but with no change in duty, imports might be 35 percent larger than in 1939, or 16,800 tons. On the assumption of a 20-percent higher unit value, the foreign value of imports would be about \$885,000.

Duty reduced by 50 percent.—The volume of imports might reflect lower rates to the extent of being 10 percent larger than with duty as in 1939, or 18,700 tons, with a total foreign value of \$985,000.

Duty increased by 50 percent.—In this situation imports might be curtailed to around 8,700 tons, or about 50 percent less than with the duty unchanged, with a total foreign value of approximately \$460,000.

Exports

The trend of production in other countries, particularly in view of the establishment of paperboard industries, tends to limit the growth of domestic shipments to foreign markets. In the long run, at a low-income level, exports might be about 75,000 tons, valued at nearly 4.3 million dollars. It is possible that under the higher income level, exports might be 130 percent of those in 1939 and reach 95,000 tons, with a total value of 6.0 million dollars.

Employment

The output of fiber and paperboard per worker is relatively large, and it is estimated that about 8,000 men were employed in the industry in 1939. An increase in production 40 percent greater than in 1939 would result in a proportionate increase in the number of workers and would bring the total to 11,200 men.

MANUFACTURES OF PAPIER MÂCHÉ

Tariff paragraph: 1403.
 Commodity: Manufactures of papier mâché, n. s. p. f.
 Rate of duty: 25% ad val.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports, to consumption
	Total	For ex- port	For do- mestic market			
Value (\$1,000).....	1 1,400	1 50	1 1,350	1 490	1,840	Percent 17.2
Persons employed (number).....	1 300					

¹ Estimated.
² Landed value; foreign value was \$316,000.

The manufactures of papier mâché discussed here include fruit, flower, animal, and bird forms; manikins and novelty figurines; religious and display figures; cores; theatrical backgrounds and properties; trays, bowls, vases, and dishes; surgical and anatomical models; and toys, ornaments, and favors. Some of the domestic concerns manufacturing articles of papier mâché also produce molded products made from other materials.

The consumption of papier mâché goods in the United States in recent pre-war years averaged about 1.8 million dollars annually. About half this amount represents utility articles for which a fairly steady market exists; the remainder is made up of novelty and luxury articles, the demand for which varies widely from season to season and from year to year. Domestic production generally supplies about 80 percent of consumption, but since the beginning of the war it has supplied almost all.

During 1925-39 imports ranged from \$206,000 to \$582,000 (foreign value), but showed no particular trend. Most of the imports came from Germany, Japan, Italy, and France; smaller quantities from other European and Far Eastern sources.

Exports of manufactures of papier mâché have not been separately recorded by either quantity or value, but are estimated to have ranged from \$40,000 to \$60,000 annually for a number of years before 1939. The exports went principally to the Latin American countries.

Production, imports, and exports of papier mâché articles may be influenced to some extent by the increasing use of plastics and plastic compounds in combination with other materials in making many of this class of manufactures.

POST-WAR SHORT TERM

Consumption will probably be somewhat greater than in 1939, the extent being dependent upon the growth in the use of moderate priced plastic compounds in place of papier mâché. Models used in the teaching of medicine, surgery, dentistry, and other professional

and scientific subjects will be required, and in many schools replacements will be necessary. Novelty articles of various types will probably be marketed in larger volume. Domestic production will probably supply the greater part of this demand, largely because the industries of some of the major countries which formerly furnished imports will, presumably, be seriously disorganized. Exports are likely to be about what they were in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption may be about 15 percent greater than in 1939 and have a value of about 2.1 million dollars (value of domestic production plus the landed value of imports), the increase exceeding that in the population principally because of an increased demand for models and manikins, display parts and pieces and similar equipment used for retail merchandising, and the need for new equipment in certain fields of instruction. Changes of 50 percent in the rate of duty would presumably affect consumption somewhat, but not enough to warrant separate estimates for the several duty levels. Domestic production will probably increase in about the same proportion as consumption. Production for the domestic market may be estimated at 1.5-1.9 million dollars, depending on volume of imports under the various levels of duty considered.

Duty as in 1939.—Imports may be 10 percent greater than in 1939, with a total foreign value of perhaps \$350,000 (landed value about \$530,000). They would probably include most of the same types of goods as were imported in the period from 1929 to 1939. Production for the domestic market may be valued at about 1.6 million dollars.

Duty reduced by 50 percent.—Imports might be 15-20 percent higher than with the duty as in 1939 and total, say, \$410,000 (foreign value); production for the domestic market would then be valued at about 1.5 million dollars.

Duty increased by 50 percent.—Imports might be less than one-half as large as with an unchanged duty; and thus amount to about \$160,000 (foreign value), principally because under the higher duties foreign novelty articles would probably find only limited markets. Production for the domestic market may be estimated at about 1.9 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of papier mâché articles might be 40 percent higher in quantity and unit prices 15 percent higher than with income as in 1939. The total value would then amount to 3.4 million dollars, imports being reckoned at their landed value. The major part of the consumption would probably be made up of display pieces, figures, models, and religious articles. Domestic production would be likely to increase in greater proportion than imports.

Duty as in 1939.—Imports might be 40 percent higher than with income as in 1939 and have a foreign value of about \$490,000. Production for the domestic market in that case would be almost 2.7 million dollars, or about 70 percent more than at the lower income level.

Duty reduced by 50 percent.—Imports might be 15-20 percent greater than with an unchanged duty, with a total foreign value of \$570,000; and production might aggregate about 2.6 million dollars.

Duty increased by 50 percent.—Imports might be expected to total about \$225,000, foreign value, and production, approximately 3.1 million dollars.

Exports

Exports of papier mâché articles averaged about \$50,000 annually for several years before 1940. After the war they may have approximately the same value, on the basis of the 1939 income level; and they may amount to about \$75,000 on the basis of the higher income level.

Employment

About 300 persons were employed in making papier mâché products here in 1939. In the post-war period, employment may be expected to be about the same, on the basis of the 1939 income level, and may be expected to reach about 500 on the basis of the higher income level.

FINE TISSUE PAPERS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1404	Fine tissue papers:		
	Weighing not over 6 lb. per ream and valued at more than 15¢ per lb.	6¢ per lb. + 20% ad val.	30.1%
	Weighing not over 6 lb. per ream and valued at more than 15¢ per lb.	4¢ per lb. + 15% ad val.*	22.9%
	Weighing over 6 lb. and less than 10 lb. per ream and valued at more than 15¢ per lb.	5¢ per lb. + 15% ad val.	23.9%
	Weighing over 6 lb. and less than 10 lb. per ream and valued at more than 15¢ per lb.	4¢ per lb. + 10% ad val.*	19.4%
	Weighing over 6 lb. and less than 10 lb. per ream and valued at not more than 15¢ per lb.	2½¢ per lb. + 7½% ad val.	29.1%
	Weighted average		24.6%

NOTE.—Papers covered by this report were dutiable under the Tariff Act of 1930 at 6¢ per pound plus 20 percent ad valorem or 5 cents per pound plus 15 percent ad valorem. The rates shown above, marked by an asterisk (*), are those which were changed pursuant to the trade agreements with Canada and the United Kingdom, effective January 1, 1939. The reduced rate of 3¢ per pound plus 10 percent on the light-weight bracket, valued at not more than 15¢ per pound, is not shown because there were no imports in 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 19,150	1 200	1 18,950	1,763	20,713	Percent 8.5
Value (\$1,000).....	1 4,644	1 46	1 4,595	1 906		
Unit value (cents per pound).....	1 24¼	1 24¼	1 24¼	51		
Persons employed (number).....	1 300					

1 Estimated.
2 Foreign value.

Fine tissues comprise a group of light-weight papers, such as carbonizing, stereotype, condenser, and pottery, as distinguished from papers such as waxing, wrapping, toweling, toilet, and pattern, most of which consist of papers weighing over 10 pounds per ream. Carbonizing, condenser, and copying tissue form about three-fourths of the total domestic production of fine tissues. Nearly 65 percent of the total weight of imports in 1939 was carbonizing tissue, a relatively high-priced variety of tissue paper, principally the product of the United Kingdom; an additional 20 percent of imports was copying paper imported from Japan.

The imported tissue papers covered by this statement do not exceed 10 pounds per ream in weight. In statistics of domestic production, data concerning the weight per ream of the several classes of paper classed as tissue are not shown, but it is known that a large part (probably much over half) of the production exceeds 10 pounds per ream in weight. It is inappropriate, therefore, to compare the imports of tissue paper under paragraph 1404 with the total domestic production. However, considerable quantities of the domestic production, both in the group designated as "high grade tissue" and in some of the other groups distinguished by the census, actually weigh less than 10 pounds per ream.

Tissue papers weighing more than 10 pounds per ream (except India or Bible paper and crepe paper, which are subject to special provisions in paragraph 1404 but are not covered by this report) are dutiable under various other paragraphs of schedule 14 and are not shown separately in the trade statistics. It is probable that there are practically no imports of these heavier tissue papers, except Bible and crepe paper, of which the reported imports are small.

The second trade agreement with Canada, effective January 1, 1939, reduced by 50 percent the duties on the two weight brackets of tissue paper valued at not more than 15 cents per pound. In 1939, however, the total imports valued at not more than 15 cents per pound were insignificant (\$124), compared with more than \$900,000 worth of imports, valued at more than 15 cents per pound. It is uncertain whether even an additional 50 percent reduction in this reduced duty on the lower-priced tissue papers weighing less than 10 pounds per ream would result in significant imports. How much of the domestic production of light-weight tissue paper is valued at not more than 15 cents per pound is not known, but it is probable that the quantities are relatively small.

The census statistics of domestic production do not distinguish any of the specific types of paper which are shown in the import statistics, such as stereotype, copying, condenser, etc. They do distinguish a group known as high grade tissue (cigarette, condenser, carbon, etc.), but part of this group consists of paper weighing more than 10 pounds per ream, and it has been necessary for the Tariff Commission to estimate the domestic production of light-weight papers corresponding to the papers which are imported.

The total quantity of tissue papers reported by the Bureau of the Census as produced in 1939 was 1.2 billion pounds, valued at 64.5 million dollars. The average value per pound was 4.8 cents. These figures include both the fine and common grades of tissues.

Domestic production of fine tissues has increased somewhat during the war years while imports have decreased substantially. Some con-

verters and consumers who have been supplied during the war years by domestic production instead of imports may continue to use papers made in this country with the result that imports may in the future constitute a smaller proportion of consumption.

Before the war there was an upward trend in the consumption of fine tissue papers, and it seems reasonable to expect this trend to continue in the post-war period.

POST-WAR SHORT TERM

Consumption of fine tissue papers may be substantially greater than in 1939. Production will probably continue on a considerably higher level than that of 1939 to meet the increased requirements, and with prices somewhat higher than in 1939, the value of production may be substantially above the 1939 figure. It is unlikely that shipments to this country in pre-war volume can be attained for some time by the mills of the United Kingdom, France, Italy, and Japan, the principal foreign suppliers.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Owing to the probable continuation of the pre-war upward trend of consumption of fine tissue papers, as well as to growth in population, the amount consumed under these conditions might be about 35 percent above the 1939 level, or approximately 28 million pounds. Prices might be about 10 percent higher than in 1939 in line with the expected increase in the price level of most papers. Consumption might be affected somewhat by change in the rate of duty, but probably not enough to warrant separate statistical estimates.

Duty as in 1939.—Imports might be about 15 percent greater than in 1939 and amount to around 2.0 million pounds with a foreign value of 1.1 million dollars. Production for the domestic market would then be in the neighborhood of 26 million pounds, valued at approximately 7.0 million dollars.

Duty reduced by 50 percent.—Imports might increase to around 2.5 million pounds (25 percent more than if the duty were unchanged) with a foreign value of about 1.4 million dollars. Production for the domestic market would then probably be about 25.5 million pounds, valued at about 6.9 million dollars.

Duty increased by 50 percent.—Imports might be seriously curtailed by increased rates, inasmuch as the equivalent ad valorem (calculated on the basis of foreign value of imports in 1939) would range from a minimum of 30 to a maximum of 45 percent. It is likely that imports would not exceed 875,000 pounds, approximately 45 percent of the amount at the 1939 duty level, with a foreign value of about \$490,000. Production for the domestic market in this case would be about 27.1 million pounds, valued at about 7.3 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption under this level of income might be about one-third greater than at the lower income level, or, say, 37 million pounds, and prices of this type of paper might rise about 35 percent compared with 1939.

Duty as in 1939.—Imports might be about one-third greater than with income as in 1939, or about 2.7 million pounds, with a foreign value of nearly 1.9 million dollars. In this case domestic production might be about 34.3 million pounds, valued at nearly 11.3 million dollars.

Duty reduced by 50 percent.—Under a lower duty imports might reach 3.4 million pounds, with a foreign value of 2.4 million dollars, and production for the domestic market might be approximately 33.6 million pounds, valued at 11 million dollars.

Duty increased by 50 percent.—The volume of imports might be somewhat less than one-half the amount that would be entered if the duty remained unchanged, or about 1.2 million pounds, with a foreign value of around \$800,000. Production for the domestic market might be 35.8 million pounds, valued at 11.8 million dollars.

Exports

United States exports of fine tissue papers are not separately shown in statistics but it is known that exports have been small relative to production. It is likely, however, that with the national income at the 1939 level, exports might increase to 300,000 pounds, with a value of \$80,000. With an increased per capita income, exports might increase to 400,000 pounds, valued at about \$130,000.

Employment

Possibly 300 workers were engaged in the production of fine tissue papers in the United States before the war and post-war employment might amount to as much as 350.

PHOTOGRAPHIC PAPER

Tariff paragraph: 1405.

Commodity: Photographic paper.

Rates of duty: Unsensitized basic paper, 5 percent ad val.; baryta-coated paper, 5 percent ad val.; sensitized paper, 22½ percent ad val.

NOTE.—The above rates are those fixed in the Tariff Act of 1930 except the rate on sensitized paper, which was 30 percent ad valorem under the tariff act and was reduced to 22½ percent, effective May 1, 1935, pursuant to the trade agreement with Belgium.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	21,095	1,190	19,905	2,488	22,393	Percent 11.1
Value (\$1,000).....	16,821	899	14,922	1,144		
Unit value (per pound).....	\$0.75	\$0.76	\$0.75	\$0.46		
Persons employed (number).....	850					

† Estimated.

‡ Foreign value.

Unsensitized basic paper is a high-grade specialty paper which becomes the photographic paper of commerce upon further processing. Baryta-coated paper is an unsensitized basic paper which has been coated with a solution of gelatine and barium salts as one of the preliminary steps through which it passes in the sensitizing process. About 20 percent of total imports in 1939 (in value) consisted of the basic paper, 25 percent was baryta-coated paper, and 45 percent was sensitized paper. Only the imports of the latter, dutiable at 22½ percent ad valorem, would be much affected by a 50-percent change in duty. In the pre-war period, Germany was the principal source of imports of basic and baryta-coated paper, with much smaller quantities from Belgium and the United Kingdom. On the other hand, nearly the entire volume of the imports of sensitized photographic paper came from Belgium. During the war years imports of basic and sensitized photographic papers declined substantially, although imports of baryta-coated paper continued on a high level.

Production of photographic paper in the United States is very large. Approximately 5 percent of the domestic output is exported in worldwide trade, although nearly one-half of the total exports in 1939 went to three countries—the Philippine Islands, Mexico, and Canada.

POST-WAR SHORT TERM

Consumption of photographic paper in the immediate post-war years may possibly be slightly larger than in 1939. However, imports will probably be somewhat less than in 1939, depending upon how quickly and successfully the industries in Belgium and Germany can be reestablished and foreign trade resumed. Exports may be no larger than the pre-war level.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Allowing for an increase in population and a greater use of photography for commercial, professional, and civilian purposes, consumption of photographic paper in the United States may be 20 percent greater than in 1939 and amount to around 27 million pounds. The price per pound of photographic paper, domestic and foreign, would probably increase by 5 percent. Consumption would be slightly affected by changes in duty but not sufficiently to warrant separate estimates under these assumptions.

Duty as in 1939.—Assuming complete reestablishment of the foreign industry, imports may be 115 percent of the 1939 volume, or about 2.8 million pounds, with a total foreign value of around 1.3 million dollars. Production, excluding exports, may be about 24.2 million pounds, valued at 19.1 million dollars.

Duty reduced by 50 percent.—Lower duty rates might bring imports up to about 3.1 million pounds, about 10 percent more than with duties as in 1939, with a total foreign value of about 1.5 million dollars. In this case production for the domestic market might be 23.9 million pounds, valued at 18.9 million dollars.

Duty increased by 50 percent.—Higher duties might result in 10 percent less imports than with duties as in 1939, or about 2.5 million pounds, with a total foreign value of approximately 1.2 million dollars. Production for the domestic market might reach 24.5 million pounds, with a total value of approximately 19.4 million dollars.

Per capita income 75 percent higher than in 1939.

United States consumption of photographic paper at this income level might approximate 32 million pounds, or about 20 percent larger than with income as in 1939. Prices for both the domestic and the foreign product would probably be 10 percent higher than in 1939.

Duty as in 1939.—Imports would possibly be 3.3 million pounds, and have a total foreign value of 1.7 million dollars. Under these circumstances production for the domestic market might be around 28.7 million pounds valued at 23.8 million dollars.

Duty reduced by 50 percent.—Imports might be 10 percent greater than with no change in duty, or about 3.6 million pounds, with a total foreign value of 1.8 million dollars. In this case production for the domestic market might approximate 28.4 million pounds, valued at 23.6 million dollars.

Duty increased by 50 percent.—Higher rates of duty would probably result in imports of about 3 million pounds, with a slightly higher total foreign value of 1.5 million dollars. Production for the domestic market would probably be nearly 29 million pounds, with a value of 24.1 million dollars.

Exports

Before the war, exports of photographic paper from the United States were made to nearly all nations of the world, a large proportion going to the Philippine Islands, Mexico, and Canada. Increased interest in photography in many countries in the post-war era will probably result in exports of domestic photographic paper of about 1.4 million pounds, valued at about 1.1 million dollars, if the level of income is the same as in 1939, and to about 1.5 million pounds, valued at approximately 1.2 million dollars, if the level of income is 75 percent higher.

Employment

Statistics covering the number of workers engaged in the production of photographic paper are not available. In several large domestic establishments, a wide range of products such as film, cameras, and photographic equipment in general is made as well as photographic paper, and it is difficult to estimate the number of workers engaged in the production of photographic paper alone. The number employed in the post-war period would be greater than in 1939 in proportion to increase in the post-war output.

GREASEPROOF AND WATERPROOF PAPER

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1405	Greaseproof and imitation parchment paper, supercalendered and transparent.	3¢ per lb. + 15% ad val.	52.7%
	Vegetable parchment paper.....	2¢ per lb. + 10% ad val.	21.9%
	Paraffined or wax-coated paper....	3¢ per lb. + 15% ad val.	40.5%
	Greaseproof and imitation parchment paper, n. s. p. f.	3¢ per lb. + 15% ad val.	25.4%

Note.—The rate fixed in the Tariff Act of 1930 on all the articles covered by this report was 3 cents per pound plus 15 percent ad valorem. The duty on vegetable parchment paper was reduced to 2 cents plus 10 percent, effective May 1, 1935, pursuant to trade agreement with Belgium.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (short tons).....	1 446,400	4,620	441,780	340	442,120	Percent 0.1
Value (\$1,000).....	1 78,321	1,082	70,339	166		
Unit value (per ton).....	\$176	\$429	\$178	\$488		
Persons employed (number).....	10,000					

¹ Quantity of vegetable parchment and waxed paper produced not reported separately. Estimated quantity and value included herein.

² Foreign value.

³ Estimated.

Papers of the group considered here are manufactured to be especially resistant to oil, grease, or water. The group includes wax- and paraffin-coated or impregnated paper, glassine (a transparent sheet), greaseproof and imitation parchment papers, and vegetable parchment. Glassine, greaseproof, and imitation parchment papers are made from highly hydrated wood pulp; vegetable parchment is rendered greaseproof and waterproof by chemical treatment. These papers are generally light in weight and are commonly used for wrapping or packaging oily, greasy, or moist foodstuffs, including meat and fish. Glassine is also used as a transparent moisture-resistant covering for packages, while vegetable parchment is utilized chiefly by the dairy industry for packing butter, cheese, and similar products. Some heavier imitation parchment paper is used for lamp shades, other decorative purposes, and printing.

About four-fifths of the domestic production of the papers under consideration consists of waxed or paraffined papers, but all the main types are produced in the United States in large quantities compared with imports. The imports have consisted mainly of greaseproof and imitation parchment papers of relatively high unit value. A number of years before the war, vegetable parchment constituted a substantially larger part of the total imports than in more recent pre-war years, the decrease being due to expanded domestic production. Imports of the lower priced waxed paper are very small. Exports in the pre-war years were 10 to 15 times the volume of imports, and it is unlikely that, even if duties should be reduced by 50 percent, imports would supply much of the domestic demand for these products.

Exports of these papers, which for some years before 1939 were of substantial volume, have increased considerably during the present war. Most of the exports consist of greaseproof and specially waterproofed glassine paper and go to Canada, the United Kingdom, and Latin-American countries. The remainder consists mainly of heavy parchment. Waxed and paraffined papers are less able to stand shipment during certain seasons and to certain countries and hence are of less importance in export trade as well as in imports.

POST-WAR SHORT TERM

Consumption of greaseproof and waterproof papers may be considerably greater than in 1939 because of the increased volume of foodstuffs stored and shipped and their expanded use in the quick freezing of meats, fish, vegetables, and fruit for domestic consumption. Production is therefore likely to increase markedly. Imports may be even less than in 1939. Exports may increase well beyond those of 1939, principally because the Latin-American countries, which make little or none of these papers, will probably require larger quantities for use in post-war retail merchandising.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of these papers may be about 25 percent greater than in 1939, or 550,000 tons, largely because of the wider uses to which some of these papers will be put in packing, storing, and distributing all types of foodstuffs, both frozen and fresh. Production for the domestic market may be practically identical with consumption, and be valued at about 96 million dollars, assuming prices about the same as in 1939. Total production including exports may be 560,000 tons, valued at 98 million dollars. Changes of 50 percent in the rates of duty would not affect these figures perceptibly.

Duty as in 1939.—With duties as in 1939, imports might be slightly below the 1939 volume, perhaps about 300 tons, valued at nearly \$150,000.

Duty reduced by 50 percent.—Imports might be double those of 1939 or might be as much as 700 tons, valued at about \$340,000, foreign value.

Duty increased by 50 percent.—Imports would probably not exceed 100 tons, valued at about \$49,000.

Per capita income 75 percent higher than in 1939.

With high national income, considerably more of these papers would be used in wrapping foodstuffs and other moist or greasy materials. Consumption might be nearly 20 percent greater than with income as in 1939, say, 660,000 tons. Production for the domestic market would be practically identical with consumption, and prices probably about 10 percent above the 1939 level; the value of such production might be about 125 million dollars. High national income in foreign countries might increase exports by 20 percent, or to about 12,000 tons, in which case the total domestic production would be about 672,000 tons, with a value of about 130 million dollars.

Duty as in 1939.—Imports of these papers under conditions of increased income and no change in duty might be 25 percent greater than in 1939, or approximately 425 tons, valued at nearly \$230,000, foreign value.

Duty reduced by 50 percent.—With an increased income and considerably reduced duty, imports might be 125 percent above those of 1939, or about 765 tons, with a value of approximately \$410,000.

Duty increased by 50 percent.—With a higher rate of duty, imports might again be markedly reduced and would probably not exceed 150 tons, valued at a little more than \$80,000.

Exports

It is probable that, with an increase in the practice in foreign countries of wrapping foodstuffs in papers of this type, exports might in the long-term post-war period be as much as 10,000 tons, valued at 4.7 million dollars, even if world income remained at the 1939 level. With a 75-percent increase in world income, exports might rise to 12,000 tons, valued at about 6 million dollars. Most of the exports would probably consist of greaseproof and glassine grades, having their principal markets in the Latin-American countries and the Far East.

Employment

With production as estimated at the 1939 level of income, the number of persons employed in the manufacture of these papers might reach 11,500, and at the higher income level, about 13,000.

BOXES OF PAPER, PAPIER MÂCHÉ, OR WOOD, COVERED OR LINED

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1405	Boxes of paper, papier mâché, or wood, covered or lined:		
	With surface-coated, parchment, lithographed, or similar papers.	5¢ per lb. + 10% ad val.	19.3%
	With cotton or other vegetable fiber.	5¢ per lb. + 20% ad val.	27.6%

NOTE.—The rate fixed in the Tariff Act of 1930 on boxes covered by this report was 5 cents per pound plus 20 percent ad valorem. The rate on all boxes except those covered or lined with cotton or other vegetable fiber was reduced to 5 cents per pound plus 10 percent ad valorem, effective January 1, 1939, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 19,839	1 75	1 19,764	291	20,055	Percent 1.4
Value (\$1,000).....	5,952	1 30	1 5,922	1 171		
Unit value (cents per pound).....	1 30	1 40	1 30	59		
Persons employed (number).....	1 2,500					

1 Estimated.
2 Foreign value.

The boxes in this category embrace a wide variety of shapes and sizes, used for packaging various articles such as cosmetics, perfumes, jewelry, fountain pens, automatic pencils, hats, etc., sold by the retail trade. Also included are paper boxes covered with surface-coated paper used by stores for the packaging of gifts, particularly during the Christmas holiday season. Boxes covered or lined with cotton or other vegetable fiber are chiefly those used by the jewelry trade. Fancy or decorated boxes imported in the pre-war period were in large part specially designed for the packaging of certain brands of perfume and cosmetics, and many of them were of odd shapes and sizes not adaptable to other uses. Fifty percent of the total value of box imports in 1939 were from France, 29 percent from the United Kingdom, and 11 percent from Japan. Exports of boxes of the types under discussion are relatively small and go chiefly to Canada. Domestic consumption declined substantially during the war years because of the necessity of using paper and paperboard for more essential purposes.

POST-WAR SHORT TERM

Consumption of covered or decorated boxes may somewhat exceed that of 1939. Imports are likely to be very much less than in 1939, owing to the lack of raw materials in foreign countries and the necessity of reestablishing sales in this country of foreign products in the packaging of which imported boxes are used. Exports will possibly

be no greater than in pre-war years. Domestic production will be somewhat larger than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption will possibly increase by 10 percent over 1939, and total about 22 million pounds. Production would also be about 10 percent greater than in 1939 or 21.8 million pounds valued at 7.0 million dollars, allowing for a 5 percent increase in prices. Changes in imports under the different rate of duty will probably have only a very small effect upon production.

Duty as in 1939.—Imports are likely to constitute about the same proportion of consumption as in 1939, or about 320,000 pounds. The foreign value of imports would amount to about \$200,000.

Duty reduced by 50 percent.—Imports might be about 10 percent larger than with the duty as in 1939, or, roughly, 350,000 pounds, with a foreign value of about \$220,000.

Duty increased by 50 percent.—Imports would possibly be no more than 190,000 pounds, with a foreign value in the neighborhood of \$120,000.

Per capita income 75 percent higher than in 1939.

A much higher per capita national income would in all likelihood result in a large increase in the buying of commodities packaged in fancy and gift boxes, and domestic consumption of such boxes might be 40 percent greater than with income as in 1939, or about 30 million pounds. Such expansion in consumption might result in an increase of 10 percent in the unit value of both production and imports. Production (including small exports) under these conditions would be around 29.7 million pounds with a value of about 9.8 million dollars and would be little affected by changes in imports.

Duty as in 1939.—Imports would probably be about 1.4 percent of consumption, as in 1939, or about 410,000 pounds and, assuming a 10 percent higher unit value, would have a foreign value of \$265,000.

Duty reduced by 50 percent.—Imports might be approximately 440,000 pounds, with a foreign value of \$285,000.

Duty increased by 50 percent.—Imports would possibly be no more than 220,000 pounds, valued at about \$145,000 (foreign value).

Exports

Exports of domestic-made boxes of these types have been small compared with production. Domestic exports in pre-war years were chiefly to Canada. At the low income level post-war exports might be about 85,000 pounds with a value of approximately \$35,000. Exports under a high national income might be about 100,000 pounds valued at about \$40,000.

Employment

The manufacture of fancy and coated paper boxes is largely by semiautomatic machinery, and any increase in production will probably increase employment proportionately. On the basis of the above estimates of production, employment may range from 2,700 to 3,700 persons, depending upon the assumptions regarding the rates of duty and national income.

SURFACE-COATED PAPERS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1405	Papers wholly or partly covered with metal or its solutions, gelatin, linseed oil cement, or flock.	5¢ per lb. + 15% ad val.	27.7%
	Papers wholly or partly covered with metal or its solutions and weighing less than 15 lb. per ream of 480 sheets (20" x 25").	5¢ per lb. + 18% ad val.	28.5%
	Papers with coated surface or surfaces, embossed or printed otherwise than lithographically.	5¢ per lb. + 15% ad val.	34.9%
	Papers with coated surface or surfaces, n. s. p. f.	5¢ per lb. + 15% ad val.	25.1%
	Gummed papers, n. s. p. f.-----	5¢ per lb.-----	4.4%

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (short tons).....	1,550,000	7,076	542,924	325	543,249	Percent
Value (\$1,000).....	73,449	1,494	71,955	1,284		0.1
Unit value (per ton).....	1 \$134	\$211	\$133	\$874		
Persons employed (number).....	17,450					

† Estimated.
‡ Foreign value.

The surface-coated papers here considered include coated book papers; glazed and fancy coated papers; radioactive and fluorescent papers; gummed, varnished, and lacquered papers; pyroxylin-coated paper; other coated papers used in printing and in the manufacture of fancy boxes; and coated papers used in making instrument dials and novelties. They do not include several products of the paper-coating industry such as wax and paraffin papers (which are discussed separately with other greaseproof and waterproof papers), asphalt-coated or laminated wrapping paper, and a few others.

Consumption of these surface-coated papers is estimated to have increased about 15 percent from 1929 to 1939, all varieties sharing in the increase. The bulk of domestic production consists of printing papers coated on one or both sides and coated or glazed box cover papers. Domestic papers are generally much lower in price than any of the types imported. Much of the coated book paper is made by mills which produce the body stock and coat the paper as a secondary process. Most of the remaining surface-coated papers are made in converting plants having no paper-producing facilities.

Imports, largely from Germany, the United Kingdom, France, and Canada, have not exceeded 1,250 tons, or less than one-half of 1 percent of consumption, in any year since 1929. The imported papers have included some kinds not manufactured in the United States; or made on order for special purposes, such as gold- and silver-

leaf paper, radioactive and fluorescent papers, nacreous papers in bobbins and sheets, and plain and colored aluminum-foil papers. Exports have consistently been from two to six times greater in value than imports. Most of the exports have consisted of coated book and magazine paper and have gone principally to Canada, the United Kingdom, Mexico, and the Latin-American countries.

POST-WAR SHORT TERM

Consumption of surface-coated papers will probably be greater in the post-war short term than in 1939, largely because of the probable increase in the number and circulation of publications using this type of paper. Imports, most of which have in the past been limited to papers other than coated book, may be somewhat larger than in 1939, assuming that shipments from Germany are resumed. Exports may be considerably larger because of the growing demand for better quality printing in many countries not producing coated book and other papers of this kind.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Following the pre-war upward trend, consumption is likely to exceed the 1939 consumption of these papers by perhaps 25 percent and amount to about 680,000 tons. Domestic production, allowing for probable small exports, might amount to approximately 690,000 tons, valued at 92.5 million dollars. Prices might be at about the same level as in 1939. Consumption and production would be only slightly affected by changes in imports resulting from a 50-percent increase or decrease in the duties.

Duty as in 1939.—Imports may exceed those of 1939 by as much as 15 percent, making a total of 375 tons worth about \$330,000 (foreign value). Most of the imports will probably be decorative papers of various kinds used for covering gift and other specialty boxes.

Duty reduced by 50 percent.—Imports might be about 50 percent larger than with the duty as in 1939, or nearly 575 tons, having a foreign value of about \$500,000.

Duty increased by 50 percent.—Imports might be 40 percent less than with the duty unchanged, or about 220 tons, with a foreign value of approximately \$190,000.

Per capita income 75 percent higher than in 1939.

Consumption of these papers would probably show an increase of at least 20 percent over that with income as in 1939 and amount to about 815,000 tons. Domestic production, including exports, might be about 40 percent greater, in value, than with unchanged income, or about 830,000 tons, valued at approximately 128 million dollars. Prices of the papers here considered would probably be about 15 percent higher than in 1939. A substantial part of the imports would be decorative specialty papers for use in the manufacture of novelty containers and similar articles for which the demand may be very great under a high national income. Consequently, the increase in imports would be proportionally greater than the increase in domestic production.

Duty as in 1939.—Imports might be as much as 100 percent above

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the 1939 level, or about 650 tons, with a foreign value of around \$650,000.

Duty reduced by 50 percent.—Imports might be as much as 35 percent greater than with the duty as in 1939, or about 875 tons, valued at about \$880,000 (foreign value).

Duty increased by 50 percent.—Imports might be about 25 percent less than with the duty as in 1939 and probably would not exceed 500 tons, with a total foreign value of approximately \$500,000.

Exports

United States exports of surface-coated papers ranged from about 3,000 tons to over 10,000 tons between 1930 and 1940. If the per capita income remains at the 1939 level, exports might be about 10,000 tons, valued at approximately 2 million dollars. At the higher income level, exports might be in the neighborhood of 15,000 tons, valued at nearly 4 million dollars.

Employment

On the basis of the above estimates, employment may range from 8,500 to 10,000 persons, depending upon the assumption as to national income and rates of duties.

CERAMIC DECALCOMANIAS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1406	Ceramic decalcomanias:		
	Weighing not over 100 lbs. per 1,000 sheets, each 20" x 30".	\$1.25 per lb. + 15% ad val.	20%
	Weighing over 100 lbs. per 1,000 sheets, each 20" x 30".	\$0.30 per lb. + 15% ad val.	27%

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 255	1 5	250	203	453	Percent 45
Value (\$1,000).....	1 740	1 15	725	1 495		
Unit value (per pound).....	1 \$2.90	1 \$2.90	\$2.90	\$2.44		
Persons employed (number).....	1 450					

1 Estimated.
2 Foreign value.

Ceramic decalcomanias are series of designs lithographically printed on paper in mineral colors for use in the decoration of pottery. The paper serves merely as a medium for handling the imprint, the design

being transferred from a strip or section of a sheet of decalcomania to the piece of pottery; the mineral colors of the design fuse with the pottery when it is fired. The lithographic printing is done on duplex paper, the face sheet of which is a fine, light-weight tissue imposed by a starch adhesive upon a heavier backing sheet. The heavy backing sheet is necessary in printing, but in decorating the pottery the sheet of tissue bearing the design is stripped from the backing sheet so that it may be applied more precisely to the contour of the pieces.

The duty rates were designed to impose the same duty on ceramic decalcomanias whether imported in duplex form or stripped from the backing sheet.

United States imports in pre-war years were predominantly from Germany, with minor quantities imported from France, the United Kingdom, and Japan. During the war, imports, principally from the United Kingdom, have been but a fraction of the pre-war level; domestic production has decreased substantially.

POST-WAR SHORT TERM

Consumption of ceramic decalcomanias will probably be considerably greater than in 1939, owing to the large backlog of orders that has accumulated during the war years, if there are adequate supplies to meet these requirements. A distinctly larger domestic production would probably be required, since imports are likely (at least for some time) to be much smaller than before the war. A resumption of the German trade is not likely to occur immediately, and producers in the United Kingdom and France are not equipped to supply more than a small percentage of the total quantity imported into this country in pre-war years.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Because of increase in population, consumption of ceramic decalcomanias might be about 10 percent more than in 1939, or approximately 500,000 pounds. The level of the duty would affect consumption to some extent, but probably not enough to justify the use of separate figures in the estimates below. The level of domestic production would probably depend largely on the volume of imports from Germany. The following estimates are based upon the assumption of a complete revival of German trade.

Duty as in 1939.—Imports might supply about the same proportion as in 1939 and reach approximately 225,000 pounds. In line with a general increase in costs of designing and art work, the unit value might be 10 percent higher, so that the foreign value might be around \$600,000. Domestic production would then be around 275,000 pounds, with a value of approximately \$875,000.

Duty reduced by 50 percent.—Imports might be about 25 percent higher than with the duty unchanged, and might reach 285,000 pounds, with a foreign value of \$765,000. In that case, domestic production might amount to about 215,000 pounds, valued at approximately \$685,000.

Duty increased by 50 percent.—Much higher rates would make it more difficult for foreign producers to compete in this market and imports might be less than half as great as with the duty as in 1939, or about 100,000 pounds, with a foreign value of approximately \$270,000. Under these circumstances, domestic production might be, say, 400,000 pounds, with a value of \$1,275,000.

Per capita income 75 percent higher than in 1939.

A high national income might increase the domestic consumption of ceramic decalcomanias to about 600,000 pounds, or about 20 percent more than with income at the 1939 level. The unit value of production and of imports would possibly be 15 percent higher than in 1939.

Duty as in 1939.—On the basis of the same ratio of imports to consumption as at the 1939 income level, imports would be about 265,000 pounds, with a foreign value of \$745,000. Domestic production might, therefore, be about 335,000 pounds, with a value of nearly \$1,120,000.

Duty reduced by 50 percent.—Imports might be about 25 percent larger than with the duty unchanged, and might reach approximately 330,000 pounds, with a foreign value of \$930,000. Domestic production would be about 270,000 pounds, valued at approximately \$900,000.

Duty increased by 50 percent.—Higher rates might limit imports to as little as 45 percent of the volume with unchanged duty, or to 120,000 pounds, with a foreign value of about \$335,000. Such a reduction of imports might bring about an expansion of domestic production to about 480,000 pounds, valued at approximately \$1,600,000.

Exports

Exports have never been large, because most countries in which the commodity is used in large volume produce decalcomanias. The small exports made annually from the United States have gone principally to Canada.

Employment

Only a few establishments in this country make ceramic decalcomanias, and it is estimated that the total number of workers engaged in their manufacture does not exceed 450. On the basis of the above estimates of domestic production, employment would probably range between 400 and 900 persons, depending upon the assumptions regarding national income and rate of duty.

LITHOGRAPHICALLY PRINTED MATTER

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1406	Cigar bands, labels, and flaps.	30¢ to 65¢ per lb.	31.8%
	Decalcomanias, other than toy and ceramic.	40¢ to 65¢ per lb.	29.8%
	Transparencies	30% to 37½% ad val.	36.8%
	Fashion magazines	8¢ per lb.	7.0%
	Post cards	6¢ to 31½¢ per lb.	13.1%
	Lithographically printed matter (miscellaneous).	6¢ to 31½¢ per lb.	20.8%
	Average		22.2%

NOTE.—The rates of 40 and 50 percent ad valorem imposed by the Tariff Act of 1930 on transparencies were reduced to 30 and 37½ percent pursuant to the trade agreement with Belgium, effective May 1, 1935. The rate on certain post cards and other lithographic prints exceeding 0.020 inch in thickness and valued at more than 35 cents per pound was reduced from 8¼ to 6 cents per pound under the trade agreement with the United Kingdom, effective January 1, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds)	(1)	(1)	(1)	287	(1)	Percent
Value (\$1,000)	154,395	1,786	152,609	460	153,009	0.3
Unit value (per pound)	(1)	(1)	(1)	\$1.13		
Persons employed (number)	34,722					

¹ Not available.

² Landed value; foreign value was \$324,000.

Four-fifths of the total foreign value of imports shown in the table consisted of lithographic prints, entered principally from Germany. Approximately 11 percent were cigar bands, labels, and flaps imported principally from Cuba; 4 percent were decalcomanias imported chiefly from the United Kingdom; about 1 percent were transparencies imported largely from Belgium; nearly 2 percent were fashion magazines imported in about equal proportions from Germany and France; and around 2 percent were post cards imported principally from Germany.

The domestic lithographic industry is composed of many units, and the greater part of the work is done on a job or custom basis to individual order, with a smaller part of the product, such as calendars, commercial forms, maps, and illustrated cards, produced for general sale. The industry is widely distributed geographically and the speed with which domestic producers can make deliveries and their familiarity with domestic practices are factors which operate to limit imports. United States exports, world wide in coverage, are normally three to four times greater than the imports in value.

POST-WAR SHORT TERM

Consumption will probably be considerably higher than it was in 1939, partly because of the larger population but more especially because of the expected increase in advertising. Efforts will be made to produce many new products as well as to reestablish old ones in the favor of the buying public. Imports, on the other hand, may possibly not attain the 1939 level because of the difficulties inherent in regaining markets and customers lost through years of war and because some European countries will not have regained full production. The increase in consumption, therefore, will necessarily have to be taken care of by increase in domestic production.

POST-WAR LONG TERM**Consumption, Production, and Imports*****Per capita income at 1939 level.***

Because of the increase in population and in advertising activity even with no increase in per capita income, consumption of lithographically printed matter may possibly be about 20 percent higher than in 1939 and be valued at about 185 million dollars. Imports may be expected to supply only a very small part of domestic consumption and would probably change only moderately with 50 percent changes in United States tariffs. Production would probably be in the neighborhood of 187 million dollars, of which nearly 185 million would be for the domestic market.

Duty as in 1939.—The total foreign value of imports may be 20 percent greater than in 1939, or about \$390,000.

Duty reduced by 50 percent.—The lower duties might increase imports to approximately \$450,000 (foreign value), which would be about 15 percent greater than estimate under unchanged duties.

Duty increased by 50 percent.—Imports would probably be only two-thirds as large as the estimate under unchanged duties. Their foreign value would be in the neighborhood of \$260,000.

Per capita income 75 percent higher than in 1939.

Consumption might be 25 percent greater than with income at the 1939 level and amount to approximately 230 million dollars. Under any of the assumed levels of tariffs, imports would supply only a very small part of consumption. The value of domestic production would be about 232 million dollars, of which nearly 230 million would be for domestic consumption.

Duty as in 1939.—Imports would probably be 25 percent larger than estimated under the lower income level and would amount to around \$490,000 (foreign value).

Duty reduced by 50 percent.—Imports might be about 15 percent greater than estimated under unchanged duties and might have a foreign value of \$565,000.

Duty increased by 50 percent.—Imports might be about \$325,000, foreign value, or about one-third less than estimated under unchanged duties.

Exports

At the lower income level exports might be about 20 percent higher than in 1939 and amount to about 2.1 million dollars; under the higher income level, they might approximate 2.5 million dollars. In pre-war years exports had world-wide distribution. Approximately one-fourth of the total value went to Canada; the other principal markets were the United Kingdom, Philippine Islands, and the Union of South Africa.

Employment

A very large proportion of the total workers in the lithographic industry are highly skilled. Any expansion in the volume of lithographic printing would be reflected by an increase in the number of workers. In the post-war long term it is estimated that employment might reach about 36,000 on the basis of the 1939 level of income and 45,000 on the basis of the higher level.

DRAWING PAPER, NOT RULED, ETC.

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1407	Drawing paper, not ruled, bordered, embossed, etc.:		
	Valued at less than 40¢ per lb.	3¢ per lb. + 15% ad val.	25.9%
	Valued at 40¢ or more per lb.	2¢ per lb. + 10% ad val.	16.4%

NOTE.—The Tariff Act of 1930 imposed the rate of 3 cents per pound plus 15 percent ad valorem on unruled drawing paper weighing 8 pounds or over per ream, regardless of value. Pursuant to the trade agreement with the United Kingdom, effective January 1, 1939, the rate was reduced on the paper valued at 40 cents or more per pound to 2 cents per pound plus 10 percent ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	18,000	1,800	17,200	576	17,776	Percent 3.2
Value (\$1,000).....	2,000	188	1,912	189		
Unit value (per pound).....	\$0.11	\$0.11	\$0.11	\$0.33		
Persons employed.....	(1)					

1 Estimated.
 2 Foreign value.
 3 Production of drawing paper is not continuous in any mill; an estimate of employment therefore cannot be made.

1 Excluding imports from Germany, on which the full tariff rate of 3 cents a pound and 15 percent ad valorem applied, the equivalent ad valorem was 14 percent.

Drawing paper is classified by the producing industry as a special type of book or writing paper, the distinguishing characteristics of which are its surface finish and its ability to withstand erasure. Three classes—ground wood, chemical, and rag drawing papers—are made in the United States. The first class is used principally in schools. The better grades, those made of rag and high-grade chemical wood pulp, are used by artists, commercial designers, architects, illustrators, and draftsmen. Mills making book paper and writing paper often produce drawing paper also.

Consumption of drawing paper in the United States for several years before 1940 is estimated to have averaged about 18 million pounds, approximately half of which was ground wood drawing paper of domestic origin, valued at 5 cents a pound or less. The domestic production of drawing paper before 1940 was 16 million to 19 million pounds a year at an estimated average value of about 11 cents a pound.

Imports consisted largely of medium-grade rag or chemical drawing papers priced at from 25 to 35 cents a pound, coming principally from Germany, France, and Belgium. Little ground wood paper was imported. Some higher-grade rag drawing paper, ranging from 40 to 70 cents a pound, also came in, largely from the United Kingdom. For a number of years before 1940 relatively little annual fluctuation occurred in the volume of these imports, but in 1940 and in the following years they decreased to a small percentage of their former volume.

Exports have not been shown separately but are estimated to have been less than 1 million pounds a year and were probably limited to the cheaper grades.

POST-WAR SHORT TERM

Consumption of drawing paper will probably exceed that of 1939, because of the needs of expanded educational programs in technical fields where drafting is required and also because of increased demand from commercial artists and draftsmen. The production of medium- and better-grade drawing papers in the United States will probably be somewhat greater than in 1939 and imports may be less than in that year. Exports, always relatively insignificant in volume, are not likely to be larger and may be less than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Per capita consumption of drawing paper may be expected to be somewhat larger than it was in 1939. General expansion of educational programs and increases in commercial advertising may be expected to result in increased use. Taking account of population growth, total consumption may, therefore, be about 20 million pounds. Consumption would not be affected appreciably by changes of 50 percent in the rates of duty.

Duty as in 1939.—Imports may be as much as 10 percent greater than in 1939 and, as before the war, will probably consist mainly of papers in the medium-price range. The total will probably not exceed 635,000 pounds, with a foreign value, at 1939 prices, of nearly

\$210,000. Production for the domestic market might be about 19.3 million pounds, valued at 2.12 million dollars.

Duty reduced by 50 percent.—Imports might exceed those at the 1939 duties by about one-eighth, making a total of approximately 725,000 pounds, at a foreign value of about \$240,000. In this case domestic production, excluding that for export, might be about 19.2 million pounds, with a value of 2.11 million dollars.

Duty increased by 50 percent.—Imports might be less than half the volume of 1939 or about 250,000 pounds, with a foreign value of approximately \$83,000. Domestic production might rise to about 19.7 million pounds, valued at around 2.17 million dollars.

Per capita income 75 percent higher than in 1939.

Increased income would probably result in large increases in merchandise advertising, particularly of consumer goods of all types. Greater building activity might further increase the consumption of drawing paper by architects, builders, designers, and others in allied professional lines, and an expanded educational program would result in greater consumption of the low-grade drawing papers. Therefore, the quantity of drawing papers consumed might be as much as 80 percent more than with income as in 1939, or about 36 million pounds. Prices might be about 15 percent higher than in 1939. The share of imports in consumption, under the several assumptions regarding rates of duty, would probably be about the same as under the lower income level.

Duty as in 1939.—Imports may possibly be about 1.2 million pounds, with a foreign value of approximately \$455,000. Domestic production, excluding exports, might reach about 34.8 million pounds, with a value of 4.4 million dollars.

Duty reduced by 50 percent.—Imports might total 1.4 million pounds, with a foreign value of around \$530,000. In this case production (for the domestic market) might approximate 34.6 million pounds, valued at 4.37 million dollars.

Duty increased by 50 percent.—Imports might be reduced to about 475,000 pounds, having a foreign value of roughly \$180,000. Under these conditions production might reach 35.5 million pounds, valued at about 4.5 million dollars.

Exports

Most of the exported paper will probably be in the lower price ranges for use in schools and for art instruction generally. On the basis of per capita income at the 1939 level, post-war exports may be about 850,000 pounds valued at about \$94,000; and on the basis of the higher income level, may reach about 1 million pounds with a value of \$130,000.

Employment

Relatively few persons are engaged in the manufacture of drawing paper as a distinct type of either book or writing paper and nearly all are employed during the greater part of their time in making other papers. It is not likely that changes in production estimated in this report will materially affect the number of persons employed.

WRAPPING PAPER

Tariff paragraph: 1409.

Commodity: Wrapping paper, sulphate and sulphite, machine-glazed, and machine-finished.

Rate of duty: Sulphate, 20 percent; sulphite, 25 percent.

NOTE.—The rate fixed in the Tariff Act of 1930 on wrapping paper covered by this report was 30 percent ad valorem. The rate was reduced to 25 percent (except on straw paper), effective August 5, 1935, pursuant to trade agreement with Sweden. On November 2, 1936, the rate on sulphate only was further reduced to 20 percent, pursuant to trade agreement with Finland.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (short tons).....	1,909,461	27,222	1,882,239	14,608	1,896,847	Percent 0.8
Value (\$1,000).....	136,223	2,665	133,557	1,018		
Unit value (per ton).....	\$71	\$98	\$71	\$70		
Persons employed (number).....	22,400					

¹ Foreign value.

The wrapping papers herein considered include unbleached and bleached sulphite, semibleached sulphate, bleached sulphate, and unbleached sulphate (kraft), both machine-finished and machine-glazed, all of which together account for 80 to 90 percent of domestic production, of imports, and of consumption of wrapping paper in the United States. Not included are wrapping papers classified as decorated, embossed, printed, metal-covered, manila, greaseproof and glassine, bogus (a coarse wrapping paper made largely from waste-paper stock), mill wraps, rope and jute, tag and pattern stock, vegetable and imitation parchment, waxed, and coated or impregnated; these, together with a few specialty papers, account for the remaining 10 to 20 percent. With the exception of the greaseproof and imitation parchment papers, considered in a separate report, imports of the papers not here considered have been insignificant.

The United States paper industry produces in large volume each of the classes of papers here discussed. The greater part of the total output for sale in this country is made by southern kraft and sulphate mills, which also produce most of the wrapping paper exported. Sulphite wrapping papers are made almost entirely in the Northeastern, Lake, and Pacific Coast States, in which considerable quantities of kraft and sulphate wrappings are also produced. Before the war a substantial volume of imported sulphate pulp was consumed in the Northeastern and Lake States, some of it in the production of machine-glazed kraft paper which in these markets met competition from the lighter weight machine-glazed wrapping papers imported from Europe.

Before 1940 imports of these papers came almost entirely from Finland and Sweden. They were mainly machine-glazed and machine-finished kraft and sulphite. Imports of wrapping paper have for many years been less than 2 percent of the quantity consumed, and have averaged between 50 and 75 percent of the quantity of similar papers exported.

POST-WAR SHORT TERM

Consumption will probably be larger than in 1939 but may be limited somewhat by the capacity of the mills. Imports will probably be considerably greater than in 1939 provided the mills in Finland and Norway will have returned to normal operation. Exports may be somewhat less than in 1939 because of the increased domestic demand as well as the erection of paper and board mills in several consuming countries.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The long-term per capita consumption of these wrapping papers under 1939 income conditions is likely to grow because of expanded factory packaging of individual units of merchandise. Taking account of increase in population, consumption may be 15-30 percent more than in 1939, or 2.2-2.5 million tons. Domestic production will probably be approximately the same in volume as consumption because both exports and imports will be relatively small. The range in value of this production at 1939 prices might be 155-180 million dollars; unit values would be little affected by changes in duty.

Duty as in 1939.—Imports of these wrapping papers may be about 20,000 tons a year, valued at approximately 1.4 million dollars, foreign value. Imports will probably be chiefly light-weight machine-glazed kraft and sulphite for bag making.

Duty reduced by 50 percent.—Imports may reach 25,000-30,000 tons valued at 2.0 (1.8-2.1) million dollars, foreign value.

Duty increased by 50 percent.—It is unlikely that imports would exceed 10,000 tons at a total foreign value of about \$700,000.

Per capita income 75 percent higher than in 1939.

Increased wholesale and retail trade requiring the use of these papers in the production, packaging, and shipment of merchandise might cause consumption to exceed that at the income level of 1939 by 30-40 percent and might total 2.9-3.5 million tons. Prices would probably be about 10 percent higher than in 1939, and production, approximately equal to consumption in volume, would probably amount to 230-275 million dollars.

Duty as in 1939.—Imports might be 30-50 percent greater than the estimate on the basis of unchanged income, or 25,000-30,000 tons, having a total foreign value of 1.9-2.3 million dollars.

Duty reduced by 50 percent.—Imports might total 40,000-50,000 tons, valued at 3.1-3.9 million dollars.

Duty increased by 50 percent.—Imports might not exceed 15,000 tons, with a total value of approximately 1.2 million dollars.

Exports

Exports of wrapping paper, which in pre-war years ranged between 20,000 and 30,000 tons, with a value of from \$1,950,000-\$2,950,000, will possibly undergo little change in the long-term period if world income is at approximately 1939 levels. Exports might be 50 percent greater, however, if income were 75 percent higher and range from 30,000-45,000 tons in volume and from \$3,250,000-\$4,850,000 in value.

Employment

Over the long term it is probable that employment in the manufacture of wrapping paper may total 25,000–30,000 persons. It is not likely to exceed this maximum because output can be considerably increased through greater utilization of existing paper machine capacity with the same machine crews. These estimates include those in mill laboratories and offices as well as in a number of pulp mills attached to or affiliated with the paper mills making it.

WALLPAPER

Tariff paragraph: 1409.

Commodity: Hanging paper, printed, lithographed, dyed or colored (wallpaper).

Rate of duty: 1¢ per lb. and 10% ad *Equivalent ad valorem* (1939): 16% val.

NOTE.—The Tariff Act of 1930 imposed the rate of 1½ cents per pound plus 20 percent ad valorem, which was reduced to the rate shown above pursuant to the trade agreement with the United Kingdom, effective January 1, 1939. Imports of wallpaper from Germany were subject to the full tariff rate of 1½ cents per pound and 20 percent ad valorem, and on imports from Germany the equivalent ad valorem was 23 percent. The equivalent ad valorem on imports of wallpaper, exclusive of those from Germany, was 13 percent.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 279, 487	1 963	278, 524	471	278, 995	<i>Percent</i> 0. 2
Value (\$1,000).....	24, 954	131	24, 823	4 187		
Unit value (per pound).....	\$0. 089	\$0. 136	\$0. 089	\$0. 355		
Persons employed (number).....	2, 500					

¹ Converted from rolls to pounds on the basis of 1 roll equal to 12 ounces.

² The ratio based on value would be about 1 percent.

³ Estimated.

⁴ Foreign value.

United States imports of wallpaper are chiefly types and designs not manufactured at all, or made in only limited quantities, in this country. About three-fourths of the total value of imports in 1939 were from Germany, France, and the United Kingdom, and the value was approximately the same from each country. Eleven percent of the total represented imports from Japan. The difference in the quality of the imported paper and the domestic product is reflected in the difference in the average prices—that of the imported paper was 35.5 cents per pound whereas that of the domestic paper was but 8.9 cents per pound. Exports of domestic wallpaper are about twice as large in quantity as imports but are less in value; in 1939 nearly four-fifths of total exports were to Canada, and about 12 percent to Australia.

POST-WAR SHORT TERM

Consumption will likely be substantially greater than in 1939 as the result of the redecoration of dwellings and apartments, much of which was held in abeyance during the war, and the decoration of the large

number of houses which it is anticipated will be constructed in the immediate post-war years. The use of wallpaper has been materially curtailed during the war through the shortage of manpower for hanging it. The four principal countries supplying imports before the war have suffered heavy war losses in industry, and it is possible that imports will be considerably less than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of wallpaper, owing to the growth in population, might increase about 10 percent over 1939 and might total about 305 million pounds. The volume of production for the domestic market would be approximately the same as the amount consumed. With unit values increased about 10 percent in line with the expected rise of other papers, the value of production for the domestic market might amount to 30 million dollars.

Duty as in 1939.—On the basis of 10 percent increases both in volume and unit values, imports might be about 520,000 pounds, with a total foreign value of approximately \$200,000.

Duty reduced by 50 percent.—Imports might be about 10 percent more than if the duty were unchanged, or about 565,000 pounds, with a total value of \$220,000 (foreign value).

Duty increased by 50 percent.—It is unlikely that imports would be more than 495,000 pounds, or about 95 percent of the quantity at the 1939 duty level, with a foreign value of approximately \$195,000.

Per capita income 75 percent higher than in 1939.

The increase in residential construction which would accompany a higher level of national income would result in a greater consumption of wallpaper. It is unlikely, however, that the rate of increase in the volume of wallpaper used would be as great as the rate of increase in residential building because, at this level of per capita income, a substantial amount of the construction might be of styles in which wallpaper is not used. In addition, in homes where wallpaper might be normally used, the competition of other forms of interior decoration, especially those more costly than wallpaper, might be more severe. Under these circumstances, it might be expected that both the consumption and production for the domestic market of wallpaper might be not more than one-third greater than with income as in 1939, or about 400 million pounds. The unit value of production for the domestic market might be about 20 percent higher than with income as in 1939, a part of this increase being due to the rise in the price level and a part to a greater proportion of the higher grades of paper in the output. At this price the value of production for the domestic market might be roughly 43 million dollars.

Duty as in 1939.—Since imported wallpapers are decided luxuries a high national income would have relatively more effect in stimulating imports than domestic production. Moreover, the average quality of the imported paper might be somewhat higher than with the lower national income; the average unit value might be 20 percent higher than with the income as in 1939. Imports might thus rise to as much as 800,000 pounds, with a value of \$375,000.

Duty reduced by 50 percent.—Imports might be about 10 percent greater in quantity and value than if the duty were unchanged, amounting to perhaps 900,000 pounds, with a foreign value of \$420,000.

Duty increased by 50 percent.—Imports might be about 5 percent less than with the duty as in 1939, amounting to, say, 750,000 pounds, with a foreign value of about \$350,000.

Exports

Exports of wallpaper made in the United States are relatively small compared with production. If per capita income is the same as in 1939, exports might have about the same volume as in 1939, with a value of about \$145,000. Some expansion of exports may occur at the higher income level, but the total volume will probably not be greater than 1,2 million pounds valued at about \$200,000. The principal export markets for the domestic paper are among English-speaking people. Climatic conditions and decorative customs of long standing in many countries tend to restrict the use of wallpaper in those countries and offer little encouragement to the building up of export markets for the United States product.

Employment

Approximately 30 plants are engaged in printing wallpaper in the United States, and it is estimated they would employ about 2,700 workers in the post-war period with per capita income at the 1939 level and about 3,100 with per capita income 75 percent above 1939.

FILTERING PAPER

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1409	Filtering paper:		
	Valued at less than 75¢ per lb.	5¢ per lb. + 15% ad val.	36.4%
	Valued at 75¢ or more per lb.	2½¢ per lb. + 7½% ad val.	11.0%

NOTE.—In the Tariff Act of 1930 filtering paper was made subject to duty at the rate of 5 cents per pound plus 15 percent ad valorem, regardless of value. Effective January 1, 1939, the rate on filtering paper valued at 75 cents or more per pound was reduced to 2½ cents per pound plus 7½ percent ad valorem, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds).....	3,010	343	3,353	Percent 10.2
Value (\$1,000).....	425	318		
Unit value (per pound).....	\$0.14	\$0.93		
Persons employed.....	(4)			

¹ Exports not reported; probably very small.

² Imports consisted of 209,137 pounds of industrial filtering paper valued at \$48,913; and 133,711 pounds of technical filtering paper valued at \$269,471.

³ Foreign value.

⁴ Production of filtering paper is not continuous in any given mill and an estimate of employment cannot, therefore, be made.

Filtering paper is of two general types—that used in large volume by industry in the clarifying of liquids, and that used in exacting tests in technical laboratories. About 92 percent of United States consumption of industrial filtering paper is produced domestically; the bulk of the technical paper is imported. About seven-tenths of the industrial filtering paper (that valued at less than 75 cents per pound) imported in 1939 came from France and an additional two-tenths from the United Kingdom. The average unit value of imports in this classification was 23 cents per pound. Of the imports in 1939 of technical filtering paper (that valued at 75 cents or more per pound), slightly more than one-half came from the United Kingdom, one-fourth from Germany, and one-fifth from Sweden. The average unit value of the technical paper imported was \$2.02 per pound.

Domestic production of filtering paper, principally the industrial type, has increased substantially during the war, while the trend of imports, of both industrial and technical types, has been sharply downward.

POST-WAR SHORT TERM

Both production and consumption of nontechnical filtering paper, which increased nearly threefold during the war, will probably decline but may remain substantially above the 1939 level. Other filtering materials and mechanical filtering devices, as they become more readily obtainable after the close of the war, will lessen the demand for paper among industrial users. Unit values may possibly exceed those of 1939. Imports of industrial filtering paper may possibly be materially less than the 1939 volume, because of the disruption of foreign manufacture. Imports of technical filtering paper are not likely to exceed those of 1939. Some of the laboratory control uses of such paper which were expanded during the war may decline when hostilities cease and thus affect consumption. Unit values are high on these standard qualities and little competition exists, so that prices will probably remain at the 1939 level.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

In recent years the use of filtering paper in many lines of activity has increased and, as a result, the consumption of this paper, especially of the industrial type, may exceed that of 1939 by about 35 percent and amount to nearly 4½ million pounds, even though per capita income remains the same as in 1939. It seems reasonable to expect that the portion of industrial paper supplied by domestic production will be larger than before the war, say about 95 percent. The proportion would, however, be somewhat affected by the level of duties. Inasmuch as the ad valorem equivalent of the duty on technical paper is low, and as practically the entire domestic consumption has normally been supplied by imports, it is not likely that 50-percent changes in duty would affect the quantity of technical paper imported. Owing to the increased consumption, prices may be about 10 percent higher than in 1939.

The quantity of domestic production presumably would be larger or smaller under the various levels of duty by about the same amount

as the difference in the quantity of total imports, but these variations would be so small relative to the volume of production that separate estimates need not be made. Under the various levels of duty, domestic production might be 4.1–4.3 million pounds. The value of production would also tend to vary inversely with the volume of imports. This change would probably be more significant than the variation in the quantity of production, as the unit value of production might be slightly lower at lower duty levels and slightly higher at the high duty levels, owing to the differences in grade between domestically produced industrial paper and imported industrial paper.

Duty as in 1939.—Imports of industrial filtering paper are not likely to exceed 210,000 pounds, with a foreign value of about \$55,000. Imports of technical filtering paper might increase to approximately 150,000 pounds, valued at nearly \$335,000, foreign value. Total imports of filtering paper might, therefore, be about 360,000 pounds, with a foreign value of \$390,000. The value of domestic production might be approximately \$615,000.

Duty reduced by 50 percent.—Imports of industrial filtering paper might be about 25 percent greater than if the duty were unchanged, amounting to approximately 265,000 pounds, with a foreign value of \$65,000. For the reasons given above, imports of technical paper would probably not be significantly greater than with duties as in 1939, and thus the total imports would probably approximate 415,000 pounds in volume and \$400,000 in foreign value. The value of production might be about \$600,000.

Duty increased by 50 percent.—Imports of industrial filtering paper would probably be not over 30 percent of the amount that might enter at the 1939 duty level, amounting to about 60,000 pounds, valued at \$15,000, foreign value. With the quantity and value of imported technical paper unchanged, total imports would be about 210,000 pounds, with a foreign value of \$350,000. The value of domestic production might, therefore, reach \$660,000.

Per capita income 75 percent higher than in 1939.

Consumption of filtering paper under these circumstances would probably be about 10 percent above that at the lower income level, or about 5 million pounds; it is probable that most of the increased demand for filtering material would be supplied by mechanical and other filtering devices. Prices might remain about the same as at the lower income level. At the various duty levels considered production might total 4.6–4.8 million pounds.

Duty as in 1939.—Imports of industrial filtering paper might be 230,000 pounds, with a foreign value of approximately \$60,000, and imports of technical paper, about 160,000 pounds, valued at nearly \$355,000. Total imports might, therefore, be approximately 390,000 pounds at a foreign value of \$415,000. Domestic production would be valued at approximately \$690,000.

Duty reduced by 50 percent.—Imports of industrial paper might be about 290,000 pounds, with a foreign value of almost \$75,000. It is unlikely that the imports of technical paper would be affected by the changes in duty, and total imports of filtering paper might, therefore, amount to about 450,000 pounds valued at \$430,000 (foreign value). The value of domestic production might be approximately \$670,000.

Duty increased by 50 percent.—Imports of industrial paper might be only about 70,000 pounds, with a foreign value of about \$18,000. With technical paper imports remaining unchanged, total imports would be about 230,000 pounds, with a foreign value of nearly \$375,000. The value of domestic production might be \$720,000.

Exports

United States exports of filtering paper are not shown separately in statistics. Available information indicates that insignificant quantities of this paper were exported in 1939, and no expansion of exports is foreseen in the post-war long term.

Employment

Production of filtering paper is carried on intermittently by a few mills in this country. In a mill, filtering paper may be the product of a day's run and additional runs may be made at intervals of several weeks or months, depending on the orders in hand. No accurate estimate of the number of persons who are employed in production of this paper can be made.

PRINTED MATTER, N. S. P. F.

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1405	Printed matter, n. s. p. f. of surface-coated paper.	5¢ per lb. + 20% ad val.	23.3%
1410	Tourist literature:		
	Of foreign authorship	7½% ad val.	-----
	Of other authorship	12½% ad val.	-----
	Printed matter, n. s. p. f.:		
	Of foreign authorship	7½% ad val.	-----
	Of other authorship	20% ad val.	-----
	Average	-----	10.9%

NOTE.—The rates on tourist literature were reduced under the trade agreement with Canada, effective January 1, 1939; as fixed by the Tariff Act of 1930 they were twice those shown above. The rates on other printed matter were reduced pursuant to the agreement with the United Kingdom, effective January 1, 1939, as follows: If of foreign authorship, from 15 to 7½ percent ad valorem; other (not including that of surface-coated paper) from 25 to 20 percent ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	454,685	47,358	447,327	1700	449,027	Percent
Persons employed (number).....	114,000					(²)

¹ General commercial (job) printing. To avoid duplication, the value of newspapers and periodicals printed for publication by others is excluded from these production data.

² Estimated landed value; foreign value was \$535,000.

³ Less than 0.2 percent.

⁴ Estimated.

These classifications cover printed matter that is similar in character to the products of the domestic commercial, or job-printing industry. The domestic industry is extensive and widely distributed geographically, including local concerns in practically all sections of the country. The work consists almost wholly of printing on a job or specific-order basis, and only to a very limited extent is there direct competition between products or services of the domestic industry and printed matter actually imported.

Tourist literature and descriptive travel material relating to foreign countries constituted about two-fifths of the total value of imports in 1939. The remainder comprised a wide array of miscellaneous printed articles, including advertising media, merchandizing supplies, descriptive and instructive matter relating to other imported products, leaflets, prospectuses, folders, sketches and pictures, and other printed matter that cannot be more specifically classified. Canada and the United Kingdom were the principal sources; Germany, France, Japan, and Switzerland were also relatively large suppliers.

Domestic exports normally are many times larger than imports, and their distribution is world-wide. Canada is the most important market.

POST-WAR SHORT TERM

Consumption will probably be substantially greater than in 1939, inasmuch as production of the job-printing industry is closely related to general business and industrial activity, which is expected to be at a fairly high level. Exports may expand somewhat, and domestic production will be considerably larger than in 1939 in order to supply increased consumption and exports.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of commercial printed matter will probably increase by about 10 to 15 percent over 1939, or to about 500 million dollars, mainly by reason of population growth. Imports may increase, but their relation to consumption will remain insignificant, and production for the domestic market will be substantially equal to the value of consumption (about 500 million dollars).

Duty as in 1939.—Resumption of tourist travel will probably cause an increase in imports of tourist literature, and imports of other miscellaneous printed matter may also increase. The total may be as much as 15 percent greater than in 1939, and amount to about \$615,000, foreign value.

Duty reduced by 50 percent.—Lower rates of duty would probably have little effect on imports of some types of printed matter, but would affect others, and the total value may be about \$675,000, foreign value, or about 10 percent greater than with the duties as in 1939.

Duty increased by 50 percent.—Higher rates might result in imports about 10 percent less than with no change in duty. The foreign value would then be about \$550,000.

Per capita income 75 percent higher than in 1939.

Under conditions of highly prosperous business and industrial activity, requirements for commercial printing would expand. The value of consumption might be 35 percent greater than under an income level equal to that in 1939 and amount to approximately 675 million dollars. Production for the domestic market would be substantially equal to consumption.

Duty as in 1939.—Imports would likely be 35 percent larger than under the lower income level and be about \$830,000 (foreign value).

Duty reduced by 50 percent.—Imports might increase to about \$915,000, or 10 percent greater than if the duty remained unchanged.

Duty increased by 50 percent.—Imports would probably be about \$735,000 (foreign value), or roughly 90 percent of the amount that would be imported if the duty were unchanged.

Exports

Exports of commercial printed matter might increase in about the same proportion as domestic production and consumption and might amount to 8–11 million dollars. The value of domestic production, including production for export, would be about 508–686 million dollars.

Employment

A total of 126,000 employees, including wage earners engaged in manufacturing, distribution employees, and salaried officers and employees was reported for the commercial printing industry in 1939. Probably about 114,000 of these were engaged in the production and distribution of the material here considered. A very large proportion of the employees are highly skilled. Expansion in the volume of printing would be reflected in increased employment, although the employment increase would not be proportionate to the increase in the value of production. In the post-war long-term period, under conditions of 1939 national income, the expansion in employment would be small. Under conditions of higher income, however, it is possible that the number employed may be 150,000.

BOOKS

Tariff para- graph	Commodity	Rate of duty	Equiva- lent ad valorem (1939)
1410	Bound and unbound books, sheets and pages of books, and music in books and sheets, n. s. p. f.		
	Of foreign authorship.....	7½% ad val.....	} 8.6% (wtl. ave.)
	Of other authorship:		
	Prayer books.....	12½% ad val.....	
	Other.....	20% ad val.....	
	Book bindings wholly or in part of leather.....	15% ad val.....	
1621	Bibles.....	Free.	
1630	Books in languages other than English.....	Free.	

Note.—The rates imposed by the Tariff Act of 1930 have been reduced as follows: Books (other than prayer books) of foreign authorship from 15 to 7½ percent ad valorem, and if of other authorship, from 25 to 20 percent ad valorem; leather bindings, from 30 to 15 percent ad valorem. These reductions were made effective January 1, 1939, pursuant to the trade agreement with the United Kingdom. The rates on prayer books were reduced from 15 or 25 to 7½ or 12½ percent ad valorem under the trade agreement with Belgium, effective May 1, 1936.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹			Imports	Apparent consump- tion	Ratio of imports to con- sumption
	Total	For export	For domestic market			
Quantity (1,000 copies).....	182,319	\$ 6,778	\$ 175,541	\$ 5,996	181,407	Percent 3.2
Value (\$1,000).....	149,260	\$ 214	144,166	\$ 2,287		
Unit value (per copy).....	\$0.82	\$0.77	\$0.82	\$0.59		
Persons employed (number).....	43,000					

¹ Books printed and published. Excludes pamphlets (imports amounting to \$22,000 in 1939), and direct mail material with a production value of \$42,000,000 in 1939.

² Estimated.

³ Foreign value: Dutiable \$1,739,000, duty-free \$1,646,000; excludes books, etc., printed more than 20 years ago, and publications of certain associations and of governments; imports in 1939, \$2,141,000.

Domestic publication of books has expanded widely since 1939, largely because of the influence of book clubs and reprints in popular-priced editions, especially paper-bound pocket-sized editions. The development of wider reading habits is expected to continue and to create increased demand for new titles and standard works in higher-priced editions.

Books copyrighted in the United States are required by the copyright laws to be printed from type set, or plates made, in the United States. Consequently, imports consist of works which have never been copyrighted here or on which the copyrights have expired. Very few works of modern fiction for which there is large popular demand are imported, since these books are usually protected by American copyright.

Imports are made both in the form of bound and unbound books, including flat and folded sheets. Leather bindings are dutiable whether attached to the book or imported separately. Of the total

value of imports in 1939, Bibles constituted 11 percent; foreign-language books and pamphlets, 38 percent; prayer books, 4½ percent; music and bindings, 4½ percent; and other books in English, chiefly of foreign authorship, 41 percent.¹ The United Kingdom was the principal source of Bibles and other books in English; Belgium and Czechoslovakia, of prayer books; and Germany and France, the chief sources of foreign-language books, although to some extent imports were made from many other countries.

POST-WAR SHORT TERM

The generally increased demand for literary works developed in recent years is also likely to continue because of assumed high national income, and production of books may be very much larger than in 1939, both in quantity and total value. Imports of Bibles and general books in English will probably increase somewhat. Total imports, however, probably will not greatly exceed the 1939 level because a substantial decrease may be expected in the number of prayer books and foreign-language books that can be shipped from the war-devastated areas—Germany, France, Belgium, and Czechoslovakia. Exports of books will probably increase in about the same proportion as domestic consumption.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The expanded interest in reading developed in recent years will probably result in a per capita demand substantially higher than before the war, even if income should be no greater than in 1939. With increase in population, consumption may be about 225 million copies, or about 25 percent more than in 1939. Imports may increase proportionately, but in view of the limitations set by the copyright laws and the fact that about half of the imported books are duty-free, it is unlikely that the proportions of production supplied from domestic and foreign sources would be significantly affected by 50 percent changes in rates of duty. Production for the domestic market may supply about 97 percent of consumption, and total 217-218 million books, valued at 175-176 million dollars. These figures represent an increase of about 25 percent in quantity and 20 percent in value over 1939.

Duty as in 1939.—Imports will probably be about 7.4 million copies, valued at 4.3 million dollars, an increase of about 25 percent over 1939. The ratio of increase is about the same with respect to both quantity and value, since it is not likely that the proportion of cheaper books will increase sufficiently to cause a change in the average price.

Duty reduced by 50 percent.—Imports of dutiable books may be about 20 percent larger than with the duties as in 1939. The net increase in imports of free and dutiable books may be only 10 percent, or about 8.1 million books, valued at 4.7 million dollars.

Duty increased by 50 percent.—Dutiable imports may be about 20 percent less than with the duties as in 1939; the combined total of

¹ Books accorded duty-free entry because of special characteristics such as age, publications of societies distributed to members, Government publications, and books specially imported for the use of educational, religious, and similar institutions, and not for sale, are not included in this section of the report.

dutiable and free might be about 6.7 million copies, valued at 3.9 million dollars.

Per capita income 75 percent higher than in 1939.

With higher income there would probably be a much larger demand for books, both for current reading and reference, and for permanent libraries. The demand for higher-priced books would increase more than that for cheaper-priced ones. Partly because of this fact, and partly because of price increases, the average price is likely to be about 20 percent more than in 1939.

Total consumption of books might reach about 300 million copies, or one-third more than under conditions of 1939 income level. Domestic production would probably supply around 97 percent of consumption, and production for the domestic market might be about 290 million copies, with a value of nearly 290 million dollars, or, roughly, 200 percent of the 1939 value.

Duty as in 1939.—Imports would be likely to increase in the same ratio as consumption and might be about 10 million books, valued at about 7 million dollars.

Duty reduced by 50 percent.—Dutiable imports may be about 20 percent larger in quantity than with the duties as in 1939, but the total imports, duty-free items not being affected by changes in rates, probably would likely be about 10 percent larger, the total being about 11 million copies valued at 7.7 million dollars.

Duty increased by 50 percent.—Total imports might be about 9 million books, with a value of about 6.3 million dollars.

Exports

Exports of books have usually exceeded imports and ranged from 3 to 5 percent of production. Before the war they consisted of bound textbooks, Bibles, reference and technical works, juvenile and children's books, general fiction, and nonfiction. Unbound sheets were also exported. Canada was the principal pre-war market, taking 40 percent of the 1939 total. The United Kingdom, the Philippines, Australia, Argentina, and Brazil were large markets, and some exports were made to many other countries. During the war exports have continued, and some new markets have been developed in non-English-speaking countries which may continue in post-war years. General world-wide interest in American affairs and customs may probably result in increased demand for American books of both an educational and general literary character. Exports may, therefore, increase in about the same ratio as domestic production and range from about 8.5 million copies, valued at 6.5 million dollars at the 1939 per capita income level, to about 11 million copies, valued at 10 million dollars, if world income is substantially above the 1939 level.

Employment

About 43,000 employees were reported by the book publishing and printing industry in 1939, composed of about 23,000 wage earners engaged in manufacture, 8,000 persons engaged in distribution, and 12,000 other salaried employees and officials. This total may somewhat overstate the number actually engaged in book printing and publishing, since the industry produces other types of printed matter

to some extent. Employment would not expand proportionately with output, but in the long-term period, under conditions of 1939 income level, it might increase by about 10 percent to 47,000; and under conditions of income at the higher level it might increase about 30 percent to 56,000.

RIBBON FLY CATCHERS

Tariff Paragraph: 1413.
 Commodity: Ribbon fly catchers.
 Rate of duty: 27½ percent ad val.

NOTE.—The rate fixed in the Tariff Act of 1930 was 35 percent ad valorem, which was reduced to 27½ percent, effective May 1, 1935, pursuant to the trade agreement with Belgium.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pieces).....	1 30,000	1 95	29,905	43,599	73,504	Percent 89
Value (\$1,000).....	1 268	1 1	207	1 279		
Unit value (per 1,000 pieces).....	1 \$9.93	1 \$10.50	\$8.93	\$6.39		
Persons employed (number).....	1 125					

¹ Estimated on the basis of partial reports from the industry.
² Foreign value.

Ribbon fly-catchers are strips of paper about 1½ inches in width and 18 inches in length, one side of which has been coated with a sticky substance scented to lure flies and a poisonous ingredient to kill them once they are entrapped. The ribbons are used in kitchens, dairies, barns, and other places to which flies are attracted. Belgium supplied the bulk of United States imports in the pre-war years. Relatively small quantities came from the Netherlands, Denmark, Germany, Latvia, Poland and Danzig, the United Kingdom, and Japan. Imports declined substantially during the war, and, in 1940, Canada became the principal source, although no imports from the Dominion had entered in previous years. Only a few concerns in the United States manufacture the product.

Other methods of eliminating flies, particularly the use of sprays, have for some time influenced the demand for ribbon fly catchers. A principal uncertainty regarding the future of the trade in fly catchers and similar devices arises from the development during the war of insecticides which are reported to be exceptionally effective and which may therefore greatly reduce the demand for other devices. Fly catchers, have, however, long been a familiar article and it seems unlikely that they will disappear quickly or entirely, no matter how cheap and effective the new insecticides turn out to be. If the demand for ribbon fly catchers should be greatly reduced, it is probable that domestic production would decline more than imports, and might

disappear entirely. The wide ranges of the estimates which follow reflect these uncertainties.

POST-WAR SHORT TERM

It does not appear likely that consumption in this country in the short term will exceed that of 1939, and it may be very much less, owing to competition from insecticides.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at the 1939 level.

Consumption might be anywhere within the range of about 20-80 million pieces, i. e., from as low as 30 percent to as high as 110 percent of the 1939 quantity. If it should be at or near the lower level of this range, it seems likely that there would be little or no domestic production. If, however, other methods for the elimination of flies displace fly catchers to only a small extent, the market may be supplied by domestic and foreign production in proportions depending in part on the rate of duty.

Duty as in 1939.—Depending upon the magnitude of consumption, imports might be 20-40 million pieces, with a foreign value of \$105,000 to \$250,000. Domestic production under these circumstances might be 0-35 million pieces, with a maximum value of about \$330,000.

Duty reduced by 50 percent.—Imports might be within the range of 20-50 million pieces, with a foreign value of \$105,000 to \$275,000. Domestic production might be 0-30 million pieces, with a maximum value of about \$280,000.

Duty increased by 50 percent.—Imports might total 20-30 million pieces, with a foreign value of \$105,000 to \$165,000. Domestic production might be from practically zero to about 50 million pieces, with a maximum value of about \$470,000.

Per capita income 75 percent higher than in 1939.

United States consumption at such a level of income might be somewhat greater, or somewhat less, than under the 1939 income assumption. Similarly, imports and domestic production would probably not differ materially from the lower income level. Therefore no separate estimates are made.

Exports

The quantity of ribbon fly catchers exported from the United States is not shown separately in statistics, but in no year are they estimated to have exceeded 100,000 pieces. European manufacturers have supplied foreign markets generally and are likely to continue to do so. In the future United States exports probably will be negligible.

Employment

Ribbon fly catchers are normally produced in the United States by five concerns, and the total number of workers employed in their manufacture in 1939 is estimated at 135. Any increase in output would probably increase employment proportionately.

WOOD PULP

Tariff paragraph: 1716.
Commodity: Wood pulp.
Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Total pulp:						<i>Percent</i>
Quantity (1,000 short tons).....	6,903	140	6,853	2,026	8,879	23
Value (\$1,000).....	209,061	6,493	202,568	175,892		
Unit value (per ton).....	\$29.89 ¹	\$46.38	\$29.55	\$37.43		
Market pulp: ²						
Quantity (1,000 short tons).....	1,044	140	904	2,026	2,930	66
Value (\$1,000).....	45,543	6,493	39,050	175,892		
Unit value (per ton).....	\$43.62	\$46.38	\$43.20	\$37.46		
Persons employed (number).....	30,613					

¹ Foreign value.

² Sales of domestic pulp in United States markets (from Wood Pulp Statistics, 1944, U. S. Pulp Producers Association), exports, and imports. Value of domestic sales based on average value of each kind of pulp produced for sale as reported by Census.

Wood pulp is used principally in the manufacture of paper and boards. Nonpaper uses, which account for around 5 percent of total United States consumption, include the manufacture of moulded articles and of various products involving chemical conversion of the pulp, such as rayon and staple fiber, explosives, transparent wrappings, and cellulose plastics.

Imports of pulp were largest in 1936 and 1937 (2.3 million and 2.4 million tons, respectively). They consisted chiefly of sulphite, sulphate, and ground wood, with sulphite predominating. Sweden, Finland, Canada, Germany, and Norway were the principal pre-war sources. Canadian shipments increased during the war, but with European shipments cut off, total imports were only at about half the pre-war level.

Production of 7 million tons in 1939 (an increase from a depression level of 3.8 million tons) was the highest pre-war total, but has been surpassed by wide margins in later years, a peak output of 10.8 million tons being reached in 1942.

Wood pulp is made by several different processes and the resultant products differ materially in the uses to which they are adapted.

Sulphate pulp, constituting more than two-fifths of the total domestic output, has led in production since 1938. Before 1938 sulphite, and in earlier years ground wood, exceeded sulphate in production. Sulphite and ground wood are light-colored pulps chiefly used in white paper and light-colored boards, and production, though large, is limited by the fact that the most suitable species (spruce, hemlock, and firs other than Douglas fir) are relatively scarce in the United States (most of the imports of pulpwood are of these species but imports also are limited in quantity—see section on pulpwood under schedule 4). The sulphate process may be employed with most

species, but is chiefly used for pulping woods not readily adaptable to sulphite production. Extensive development of the pulp industry in the South, with the use of Southern pine as material, accounts for the expansion in the output of sulphate pulp in recent years. Unbleached sulphate is brown in color and is used generally in coarse paper and board where strength is desired and color is not important. During the war extensive use of bleached and semibleached sulphate has occurred. Post-war bleaching developments may result in substantial shifts from the use of unbleached sulphite to bleached or semibleached sulphate, and, therefore, greater use of pine and similar species in furnishing part of our pulp requirements for white paper that might otherwise be supplied by imports of either pulpwood, pulp, or paper.

Domestic pulp is produced chiefly by self-contained mills for conversion into paper by facilities connected with the pulp plants. Sales of pulp (including exports) accounted for only 15 percent of domestic production in 1939. Market pulp used in the United States (domestic and imported), however, constituted 33 percent of our total pulp consumption. The ratios of market pulp to total pulp consumed, and of imported pulp to total market pulp, declined sharply during the war. Imports of pulp will probably be greater after than they have been during the war, when exports from Europe to this country again become feasible. It is possible, however, that in view of the expanded domestic production, the proportion of total market pulp accounted for by imports, as well as the proportion of total pulp consumption accounted for by market pulp, will be smaller in the future than in the pre-war period.

The present capacity of the domestic industry (in 1944), if operated under normal conditions, is about 11,700,000 tons annually; under accelerated or "forced draft" operation a higher level of production could be maintained for a time, as it has been during the war. Pulpwood, under present forestry practices, could probably be obtained for operations of pulp mills at these levels for a period of time, but at least in some regions it would result in excessive depletion of standing timber. The situation would probably be relieved to some extent by a broadening of the supply base by such means as wider use of hardwoods and species of softwoods not now generally used, by opening Alaskan forests, and more efficient utilization. Large imports of wood might also be made from sources outside North America (see section on pulpwood, under schedule 4).

POST-WAR SHORT TERM

When wartime limitations on the use of paper are removed, the consumption of paper, and consequently of pulp, may increase markedly. Substantial quantities of pulp may also be required for inventory replenishment and for increased production of synthetic fibers and cellulose derivatives. Consequently, the consumption of wood pulp will probably exceed the 1939 totals by very large margins, and may even be somewhat larger than the wartime peak, since civilian consumption of paper and boards has been restricted during the war. Imports will probably not be as large as in 1939, as shipments from Europe are not likely to have regained pre-war levels. European demand will be large and, except in Sweden, the pre-war capacities of

European pulp industries may not be restored for several years. European producers, however, will endeavor to maintain connections here and ship as much pulp as possible. Owing to the increase in consumption and decline in imports, domestic production will probably be much greater than in 1939.

Prices of pulp are not likely to drop below the wartime ceilings, which are much above the 1939 prices, and the total value of production is likely to be very much larger than in 1939. The total value of imports is also likely to exceed the 1939 value, notwithstanding the smaller quantity.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The demand for pulp for paper manufacture will probably exceed the 1939 total by about 10 to 15 percent, mainly by reason of growth in population. Pulp requirements for nonpaper uses may be substantially larger than in 1939, as the use of synthetic textiles and plastics made from wood cellulose is likely to increase. Total consumption of pulp, therefore, may be about 10.3 million tons, or about 15 percent greater than in 1939. Prices will probably be slightly higher, about 5 percent, since during most of 1939 pulp prices were lower than normal.

The proportion supplied by imports may be somewhat smaller than before the war in view of the greater capacity of the domestic industry. Imports are likely to be around 95 percent of the 1939 total, or about 1.9 million tons, valued at about 75 million dollars, foreign value.

Production excluding relatively small quantities for export may be about 8.4 million tons, valued at about 265 million dollars.

Per capita income 75 percent higher than in 1939.

With increased income, the consumption and production of paper and, correspondingly, the demand for pulp, will increase and are likely to be greater than during the war. Demands for pulp for chemical conversion may be somewhat larger than under conditions of income at the 1939 level. As a result, consumption of wood pulp may total about 13.8 million tons, or about 35 percent more than with income as in 1939. Prices will probably be about 20 percent higher than in 1939.

Imports are likely to supply a slightly larger proportion of consumption than under the 1939 level of income, since total demand will probably approach or exceed the capacity of the domestic industry, but the proportion may still be somewhat smaller than in pre-war years. Total imports may be about 2.8 million tons, valued at 125 million dollars.

Production for the domestic market (including considerable quantities made from imported pulpwood) is likely to be about 11.0 million tons, valued at about 395 million dollars.

The normal rated capacity of the pulp industry as at present (1944) appears adequate for production at this rate. It is probable, moreover, that additions to the domestic capacity would be made if demand should continue at these levels. The question as to the availability of pulpwood for operations of such magnitude has already been discussed.

Exports

Exports have constituted a very small proportion of total output, but a substantial percentage of market pulp. Except in 1937 and during the war they have been less than 200,000 tons annually. Japan and the United Kingdom were the principal pre-war markets, although shipments were also made to other European and Far Eastern countries. Exports to Japan consisted chiefly of dissolving pulp. During the war years exports have been above 300,000 tons and in one year reached 500,000 tons. Some of the wartime markets may be retained, and there are likely to be increased exports of dissolving pulp. Total post-war exports may be in the neighborhood of 200,000-300,000 tons, valued at 10-15 million dollars.

Employment

A total of 30,613 persons were employed by the pulp industry in 1939, of whom 26,870 were wage earners and 3,743 were salaried employees. Under the low-income assumption, employment would probably be the same as in 1939, but production under the high-income assumption, 50 to 60 percent larger than in 1939, might result in an increase in employment of about 30 to 35 percent, or a total of about 40,000. As increased output would be accomplished partly by working more days a year, the number of persons employed would not increase in the same ratio as production.

NEWSPAPERS AND PERIODICALS

Tariff paragraph: 1726.

Commodity: Newspapers and periodicals.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	(1)	(1)	(1)	3,069 733 644 \$0.209	1,249,000	Percent (1)
Value (\$1,000).....	1,255,000	6,372	1,248,000			
Unit value (per pound).....						
Persons employed (number).....	270,400					

¹ Not available.

² Estimated.

³ Landed value.

⁴ Foreign value.

⁵ Less than 0.1 percent.

⁶ Includes a relatively small number engaged in other than the direct printing and publishing of newspapers and periodicals.

In order to be eligible for duty-free entry, periodicals must be "unbound or paper-covered publications issued within six months of the time of entry, devoted to current literature of the day, or containing current literature as a predominant feature, and issued regularly

at stated periods, as weekly, monthly, or quarterly, and bearing the date of issue."

The figures on both imports and exports shown in the table are exclusive of the value of a considerable volume of newspapers, and more particularly of other periodicals, which reach individual subscribers through the mail. In effect, therefore, the statistics report only shipments in bulk for retail sale or distribution.

Nearly two-thirds of the total pre-war annual imports were from Canada and the United Kingdom, and were about evenly divided between the two countries. An additional one-sixth were from Japan, and, to a large extent, printed in the Japanese language.

Approximately two-thirds of the total value of domestic production in 1939 was that of newspapers, and the remaining one-third that of periodicals. Not all of the output of the printed matter was in English, since numerous newspapers and periodicals are printed in other languages and have in the aggregate considerable circulation.

United States exports of newspapers and periodicals in 1939 were nearly 10 times greater in value than imports. About three-fourths of the combined value of exports of newspapers and periodicals is represented by periodicals. About 86 percent of the newspapers and 80 percent of the periodicals are exported to Canada. Of the much smaller volume of exports to the United Kingdom and the Union of South Africa, practically the entire value is made up of periodicals; of those to Cuba, however, two-thirds are newspapers and one-third magazines.

During the war the weight of paper used in newspapers and periodicals has been limited by the scarcity of paper, but the number of copies published has increased and probably also the value.

POST-WAR SHORT TERM

Many factors may be expected to contribute not only to a higher consumption than in 1939, but also to very much larger imports and exports. There will be a wide interest throughout the world in the settlement of war problems and in post-war rehabilitation, in both of which the United States is expected to play a leading role. The American reading public will consequently be more interested than ever before in developments and thinking abroad, and the rest of the world more interested in developments and thinking in the United States. When adequate supplies of newsprint and other printing paper become available, the resumption of national and local advertising on a large scale will add measurably to the value of output of both newspapers and periodicals.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at the 1939 level.

The value of consumption may be expected to reflect not only the growth in population, but also a greater volume of advertising. It will probably increase over that of 1939 by about 15 percent, or to approximately 1.4 billion dollars. Although imports may be expected to supply only a very small portion of domestic consumption, they

will probably show a greater percentage increase than domestic production, principally because of stimulated interest in foreign affairs. The foreign value of imports may reach \$775,000 (\$880,000 landed value), which would be roughly 20 percent higher than in 1939.

Per capita income 75 percent higher than in 1939.

The consumption of newspapers and periodicals, especially in terms of value, is quite responsive to changes in national income. A sharp increase in income would mean increased circulation of the several types of publications and marked expansion in the volume of advertising. It is possible that the value of production, which corresponds closely with consumption, would increase about 35 percent over that of 1939 or to roughly 1.7 billion dollars (about 20 percent more than with income as in 1939). In all likelihood imports would increase about 40 percent over 1939, or to about \$900,000 (foreign value).

Exports

Countries of small population can support relatively few publications of the scope and diversified character of those produced in the United States. They consequently depend on foreign sources to supplement their own production. Greater interest in international affairs and in the progress of the world in general will in all probability be reflected in exports of domestic newspapers and magazines to the extent of possibly a 30-percent increase over the value of exports in 1939 under the premise of the 1939 level of income, and a 45-percent increase under the premise of the higher level of income. The corresponding values would be, respectively, 8.3 million and 9.2 million dollars.

Employment

An increase in the total value of production of newspapers and periodicals in the long term would not be accompanied by a proportionate increase in the number of persons employed in the industry in 1939. Expansion would be largely in the nature of volume affecting chiefly the mechanical departments. Employment in the industry in the long term might be at about the same level as in 1939 on the premise of 1939 level of income and around 300,000 persons, or approximately 10 percent higher than in 1939, on the premise of the higher level of income.

DUPLEX DECALCOMANIA PAPER

Tariff paragraph: 1735.

Commodity: Duplex decalcomania paper, not printed.

Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (short tons)	406
Value (\$1,000)	163
Unit value (per ton)	\$400

¹ Foreign value.

Duplex decalcomania paper is an unsized, glazed tissue paper evenly pasted upon a heavier backing sheet of book paper in such way as to be readily detached without tearing. When designs have been lithographically printed in color on the thinly coated tissue, this, together with the heavier backing paper, becomes a decalcomania, which is used to transfer decorative designs to pottery and other articles. The paper is converted into decalcomanias by printing in this country, and these in turn compete with imported decalcomanias (covered in another section).

As domestic production is negligible, consumption and imports of duplex decalcomania paper are practically the same. Imports from 1919 to 1939 ranged from about 145 to 406 tons annually. The average annual imports in the 5 years 1935-39 were approximately 315 tons and the average unit value was around \$425 a ton. Imports in 1939 were larger than the average of the immediate pre-war years because of the effort by importers to build up stocks in this country in anticipation of the outbreak of war. The United Kingdom is the principal source of the imports.

POST-WAR SHORT TERM

Imports will probably be considerably greater than in pre-war years because of a large domestic demand for all types of commercial and ceramic decalcomanias. Domestic production is likely to continue to be negligible.

POST-WAR LONG TERM

Consumption, Production, and Imports

Post-war imports of duplex decalcomania paper will depend to a large extent upon the volume of imports of decalcomanias. If imports of decalcomanias are large, as they might be if the duties on them were reduced by 50 percent, imports of duplex paper would be relatively small. On the other hand, if imports of decalcomanias were restricted by a 50 percent increase in the duties, larger quantities of duplex paper would be imported. In the following estimates of imports and consumption of duplex paper, it is assumed that domestic production of such paper would be negligible, as in the past.

Per capita income at 1939 level.

Imports might range from 315 tons with a foreign value of a little over \$135,000 (if the duties on decalcomanias were reduced by 50 percent) to 440 tons with a foreign value of \$187,000 (if the duties on decalcomanias were increased by 50 percent). With no change in duty on decalcomanias, the imports would probably be about 380 tons, valued at \$160,000.

Per capita income 75 percent higher than in 1939.

Consumption of duplex decalcomania paper might be 50 percent greater under this national income than under a national income at the 1939 level. Imports, therefore, might range from 475 tons, with a foreign value of \$235,000 (if the duties on decalcomanias were reduced by 50 percent and prices were 15 percent higher) to 660 tons, with a foreign value of about \$325,000 (if the duties on decalcomanias were increased by 50 percent). With no change in those duties, imports would probably be about 570 tons, valued at about \$280,000.

Exports

United States exports of duplex decalcomania paper will probably be none or negligible after the war, as they were in pre-war years.

Employment

Post-war employment in the domestic production of duplex decalcomania paper will probably be negligible.

RAGS FOR PAPER MAKING

Tariff paragraph: 1750.

Commodity: Rags for paper stock.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (short tons).....	422,016	10,970	411,046	57,241	468,287	Percent
Value (\$1,000).....	14,503	952	13,551	1,257		12
Unit value (per ton).....	\$34.36	\$86.78		\$21.96		
Persons employed (number).....	(1)					

¹ Data are not available on the quantity or value of rags produced or collected. The figure shown in the column "apparent consumption" represents actual consumption in 1939. From that figure, together with those for imports and exports, the figures for domestic production (both total and for the domestic market) have been derived.

² Foreign value.

³ Not available; estimated at from 10,000 to 25,000.

From 60 to 75 percent of the volume of rags consumed for paper making represent low-grade rags customarily consumed in the manufacture of roofing and building felts and valued at about 1 cent a pound. The better grades of rags, valued at from 5 to 7 cents a pound, are used in making writing, book, and other high-grade papers. Since 1929 there has been a marked decline in the consumption of rags by United States paper mills. This decrease was caused by the decline in the volume of construction, the substitution of waste paper and other fibrous materials for rags, and the increased proportion, in total rag collections, of rayon and other synthetic fiber rags which cannot be converted into paper.

Rags are a waste byproduct of textile mills and garment factories as well as of the household. Their collection and preparation for use is an established commercial salvaging operation, usually carried on in conjunction with the reclamation of other waste materials.

The bulk of the rags imported have been of low grade, used in making building and roofing felts. Year-to-year fluctuations in the quantities imported have been greater than the changes in the amounts consumed or exported. France, Belgium, Netherlands, Canada, Argentina, and Japan have been the principal sources of imports, although substantial amounts have come from many other countries.

Exports of rags from the United States have consisted almost entirely of better grades for use in the production of high-grade papers. Consequently the unit value of exports has been much higher than that of either imports or consumption.

POST-WAR SHORT TERM

Consumption of rags in the short term immediately following the close of the war may be substantially greater than in 1939 because of the probable expansion in building activity in which roofing and building felts are consumed. At the same time the discarding of textile goods worn out and not replaceable during the war will tend to supply a greater volume of rags of all kinds, and the manufacture of clothing and other textile products from which new rags are produced may be much increased. Imports of lower grade rags may, however, reach a volume equal to that of 1939 and a value somewhat in excess of that year. Domestic rags will continue to supply the greater part of those consumed.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The long-term consumption of rags for paper and felts may continue at only approximately the same rate as in 1939 notwithstanding increase in population, but it may increase to as much as 10 percent more than in that year, or to 470,000-515,000 tons annually. The quantity will depend largely on the extent of the post-war building program and the extent of the demand for high-grade paper. The collection of rags in the United States may remain at approximately the 1939 level or decline about 10 percent, or to 375,000-425,000 tons, valued at 12.9-14.6 million dollars, because of the probable continued increase in the use of synthetic fibers in many textiles. On the other hand, since in foreign countries there will presumably be relatively less use of synthetic fibers than in the United States, imports are likely to be larger than in 1939, perhaps about 100,000-105,000 tons, worth, at 1939 foreign unit value, approximately 2.2-2.3 million dollars.

Per capita income 75 percent higher than in 1939.

An increase in both income and population might expand considerably the demand for products in which rags are used, especially building and roofing felts, and therefore increase the demand for rags. Because of the increased proportion of nonusable synthetic fiber rags present in the rags collected in the United States, it is probable that a marked increase in the quantity of rags consumed could be maintained only if the collection of rags were encouraged by raising prices 25 percent or more above the 1939 level. Although the higher prices would probably lead to greater substitution of other materials for rags in paper making, the consumption of rags might rise above that of 1939 by 75-100 percent, or to about 820,000-940,000 tons. Imports might be 150,000-200,000 tons valued (at 25 percent above 1939 foreign values), at 4.1-5.5 million dollars. Domestic production allowing for exports would be 640,000-806,000 tons, valued at from 27.3-34.8 million dollars.

Exports

With per capita income at the 1939 level, exports of rags would probably be about the same as in 1939. With per capita income increased 75 percent exports of rags might increase to 50-75 percent above 1939 levels, making a total of about 16,500-20,000 tons valued (at 15-25 percent above 1939 unit values) at 1.8-2.2 million dollars. Those exports would probably be limited largely to high-grade rags suitable for use in making writing, filter, and printing papers and going for the most part to Canada and the United Kingdom.

Employment

The number of persons employed in the collection, importation, and sorting of rags is not likely to increase or decrease measurably above or below the number so employed in 1939, because this operation is done jointly with the salvage of a large group of waste materials. Temporary or seasonal changes might occur, but only if prices were to remain considerably above those of 1939 would any permanent expansion be likely to take place in this field.

WASTE, EXCEPT RAGS, FOR PAPER STOCK

Tariff paragraph: 1750.

Commodity: Waste bagging, gunny cloth, bags, waste paper and books, old manila rope, grasses, fibers, waste, shavings, clippings, etc., for paper making, n. e. s.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (short tons).....	5,060,838	51,446	4,999,392	56,180	5,056,572	Percent 1.2
Value (\$1,000).....	65,107	804	64,303	1,810		
Unit value (per ton).....	\$12.89	\$15.62	\$12.86	\$30.58		
Persons employed.....	(¹)					

¹ Foreign value.

² Not available; estimated at from 10,000 to 25,000.

NOTE.—Data are not available on the quantity or value of waste produced or collected. The figure shown in the column "apparent consumption" represents actual consumption in 1939 as reported by the Bureau of the Census. From that figure, together with those for imports and exports, the figures for domestic production (both total and for the domestic market) have been derived.

Waste, other than rags, for paper stock is the raw material for the pulp from which paper and board of various kinds are made. This material consists of old or scrap bagging, gunny cloth, and bags no longer useful for any other purpose, waste paper and old books, old manila rope, grasses, shavings, clippings, and similar fibrous materials of all kinds. The annual domestic consumption of these fibrous materials has shown no specific trend since World War I, although

from 1929 to 1941 the quantity consumed increased somewhat. By far the greater part of the materials used in the pre-war period consisted of waste paper and old books, a large part of which was used in the manufacture of paper board and roofing and building felts.

Most of these articles are merely the waste material or byproducts of various manufacturing or conditioning processes. Collection and preparation (conveniently called "production") of these articles, except for grasses, is an established commercial salvaging operation customarily carried on in conjunction with the reclamation of many other waste materials.

Imports of these fibrous materials into the United States since 1923 have ranged from about 25,000 tons to nearly 140,000 tons a year, with average unit values ranging from \$18 to \$63 a ton, depending on the proportions of the different types of materials included. The higher unit value of imports as compared with domestic "production" is accounted for by the higher grades and different types of materials imported. Among the countries of origin were Canada, the United Kingdom, Egypt, France, the Netherlands, Belgium, Argentina, and the Soviet Union. These imports ranged from about 1 to 3 percent of consumption.

Exports of these miscellaneous fibrous raw materials have been listed separately only since 1936. They have gone largely to Canada, the United Kingdom, and Cuba. Compared to imports, exports have usually been relatively low in unit value; the quantity has ranged from 20,000 to 75,000 tons a year. The low average unit value of these exports indicate that they may have consisted principally of waste paper for use in making coarse wrapping paper and board.

POST-WAR SHORT TERM

Consumption may be substantially greater than in 1939, because of the increased demand for packaging and shipping materials required by expanded merchandising activities, particularly in the retail field. Imports are not likely to be in proportion to this increase in consumption, and most of the greater demand may probably be supplied by domestic sources. Unit values will probably be as much as one-third higher than in 1939 and the domestic collection of waste byproducts may be considerably stimulated by these increased prices.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of these materials may be about 25 percent more than in 1939, or as much as 6.3 million tons, as a result of the greater volume of domestic trade and the expansion of residential construction, both of which consume large quantities of the papers made of these fibers. Prices, however, would probably be about the same as in 1939. Both domestic collections and imports may increase about in the same proportion. Domestic "production" might be 6.0-6.5 million tons, valued at around 80 million dollars. Imports may be as much as 75,000 tons, valued at approximately 2.2 million dollars, foreign value.

Per capita income 75 percent higher than in 1939.

High income would probably expand materially the national requirements of nearly all types of coarser papers and boards, particularly those used in packaging or wrapping, in various types of advertising displays, and in construction, and therefore also expand the consumption of the raw materials from which these are made. The reclamation of these waste materials in greater quantity might, however, depend on a higher price as an incentive to their collection. Assuming a price increase of about 33 percent, consumption might reach 7.5 million tons. Domestic production for the domestic market might be little less than the consumption, and have a total value of about 130 million dollars. Imports might, however, also increase to as much as 100,000 tons, valued at about 4 million dollars, foreign value.

Exports

With the same world per capita income as in 1939, it is probable that exports would remain at about the same as in 1939 in volume and value. With an appreciable increase in world income, and with higher prices offered, it might be expected that some types of these waste materials would show somewhat increased exports, reaching perhaps as much as 75,000 tons, with a total value of about 1.6 million dollars.

Employment

With national income as in 1939, the number of persons employed in salvage operations covering waste paper and books, old gunny cloth, rope, and similar materials for paper making, as well as rags, is not likely to change appreciably from the number so employed in 1939, especially since these materials are collected, sorted, and packed in conjunction with a number of other wastes. If, however, with high income, the prices were to rise materially, enabling the quantity collected to be considerably increased, a more or less corresponding increase in employment would be likely to occur.

NEWSPRINT PAPER

Tariff paragraph: 1772.

Commodity: Standard newsprint paper.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 short tons).....	954.3	13.5	940.8	2,615	3,555.9	Percent 73.5
Value (\$1,000).....	39,765	699	39,066	115,716	154,812	
Unit value (per short ton).....	\$41.67	\$40.55		\$44.25		
Persons employed (number).....	3,700					

¹ As reported by U. S. Department of Commerce; the nominal basis is foreign value, but being duty-free the importers may not follow this principle closely.

² Including production of pulp for newsprint.

Over a long period newsprint consumption has increased faster than the population, although the increase was interrupted by the depression following 1929 and has tended to level off during the last two decades. The proportion of the consumption supplied by imports has steadily increased until in 1939 it was about three-fourths. The relative (and recently absolute) decrease in domestic production has resulted from the depletion of the stand of spruce and balsam fir trees, the greater profit in the production of other types of paper, and the investment interest of American concerns in Canadian pulp and paper production. The bulk of the imports in the pre-war period came from Canada, with considerable quantities from Finland, Newfoundland, and Sweden.

POST-WAR SHORT TERM

Newsprint consumption, once the wartime controls are relaxed, is likely to be appreciably greater than in 1939 because of increased population and greater buying power. It may be estimated at from 3.8-4.0 million tons, or on the average about 10 percent above 1939, with a total value (at approximately 1943 unit values) ranging from 190-200 million dollars, compared with 155 million in 1939. Domestic production, however, seems unlikely to increase above the 1943 level, which was 15 percent less than in 1939, although its value will probably be nearly the same as in 1939. Consequently imports will probably be above the 1939 level both in quantity and value by at least as great a percentage (about 10 percent) as will be that for total consumption.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

In conformity with the pre-war trend toward a leveling off of per capita consumption, the volume consumed would probably exceed that of 1939 by very little more than the growth of population. It might be 10-15 percent greater than in 1939, totaling 3.9-4.1 million tons, which at 1939 unit values would aggregate 170-180 million dollars. It is possible that there might be a development of newsprint production in the South during the next decade on a scale sufficient to affect the trend of domestic production. But unless this development occurred on a substantial scale (generally considered to be unlikely), the domestic production would probably be no greater per capita than in 1939, and it might even be less. Production might be, say, 0.9-1.1 million tons, with a total value at 1939 unit values of 35-45 million dollars. Assuming the minimum probable consumption and the maximum probable ratio of domestic production to consumption, imports would be about 2.8 million tons, valued at pre-war unit values at about 125 million dollars. Assuming the maximum probable consumption and the minimum probable ratio of domestic production to consumption, the imports would be about 3.2 million tons, with a nominal foreign value (see above table) of about 145 million dollars.

Per capita income 75 percent higher than in 1939.

Newsprint consumption is considerably affected by changes in national income but little by changes in the price of newsprint. The habit of reading newspapers, once established, is seldom broken, although consumers buy papers somewhat more freely when their income is high. Advertising, moreover, tends to vary considerably with the level of business activity and national income, and thus to affect paper consumption. With a per capita real income 75 percent greater than in 1939, the per capita consumption of newsprint might be from 15 to 20 percent larger than if there were no increase in income.

Total consumption, taking account of increase in population, might be 25-35 percent higher than in 1939, or 4.4-4.8 million tons. The average unit value of production and of imports would probably be 10-15 percent higher than in 1939. The increase in consumption might stimulate domestic newsprint production, particularly in the South, so that the quantity of domestic production might possibly reach 1.3-1.4 million tons; it might, however, still be as low as 900,000 tons. The value might thus be 45-70 million dollars. Conversely, the imports might be between 3.0 million tons (minimum consumption with maximum ratio of domestic production), valued at about 145-150 million dollars, and 3.9 million tons (maximum consumption with minimum ratio of production), valued at about 190-200 million dollars.

Exports

Exports of newsprint from the United States have been incidental for many years. It is unlikely that the United States mills will be able to compete in foreign markets once the European mills are again producing and Canadian mills, previously manufacturing for export, are no longer subject to wartime restrictions. Consequently, exports are unlikely to exceed the 1939 level materially, and may even be below it.

Employment

Employment in the newsprint industry is not likely to change materially from what it was in 1939; namely, 3,700 workers, unless there is a considerable expansion of production, especially in the South, in which case total employment might reach 4,500-5,000 persons.

SCHEDULE 15. SUNDRIES, AND RELATED ITEMS PROVIDED FOR IN THE FREE LIST

INTRODUCTION AND SUMMARY

All items covered by schedule 15 and related duty-free articles of which the imports in 1939 exceeded \$100,000 are covered in this report, except the basket clause and noncommercial items listed below, for which estimates of post-war production and imports seemed impracticable:

Commodity	Tariff para- graph	Tariff status	Value of imports, 1939 <i>1,000 dollars</i>
Wax manufactures, n. e. s.	1536	Dutiable	100
Manufactures of straw, sea grass and grass	1537	do	205
Soft rubber manufactures, n. s. p. l.	1537	do	144
Phonograph parts and dictaphone records	1542	do	223
Smokers' articles, n. s. p. l.	1552	do	186
Waste other than textile and fur	1555	do	493
Manufactured dutiable articles, n. e. s.	1558	do	828
Articles, the growth, produce or manufacture of the United States, returned.	1616	Free	21, 253
Household furniture and personal effects, not merchandise	1632 1739 1747 1798 1722	do	6, 925
Moss, sea weed, and vegetable substances, crude or manufac- tured, n. s. p. l.	1722	do	357
Stamps	1771	do	709
Statuary and casts for sculpture	1773	do	201
Works of art for collections, etc.	1809	do	1, 627
Total			33, 233

The total number of dutiable or partly dutiable items for which reports are presented under schedule 15 is 50. As measured by imports, the two largest items—hides and skins, and gems—consist in large part of duty-free commodities. Of the imports of hides and skins, valued in 1939 at 47.1 million dollars, 30.2 million entered duty-free, and of the total imports of gems, valued at 38.4 million dollars, 8.1 million entered duty-free.¹ The total value of the dutiable imports of these 50 items was about 133 million dollars; the grand total of all dutiable items under this schedule was 139 million dollars. In addition to the dutiable or partly dutiable items, the reports which follow include 14 free items; the total value of the imports of these items in 1939 was 253.1 million dollars, of which 173 million consisted of unmanufactured rubber and 47.5 million of undressed furs.

The tabulation below summarizes actual production (for the domestic market) and imports for 1939 (distinguishing the dutiable

¹ In the general summary table both these composite items are included with dutiable imports.

or partly dutiable from the free), and also summarizes the estimates for the post-war long-term period under the several assumptions as to national income and levels of duty:

Period, income level, and tariff treatment	Production for the domestic market		Imports	
	Value	Ratio to 1939	Foreign value	Ratio to 1939
<i>Sundries, dutiable (or partly dutiable)</i>	<i>Millions dollars</i>	<i>Percent</i>	<i>Millions dollars</i>	<i>Percent</i>
1939.....	2,684.5	100	170.9	100
Post-war long term:				
Per capita national income same as in 1939:				
Duty as in 1939.....	3,077.8	116	194.0	113
Duty reduced 50 percent.....	3,020.4	113	203.2	120
Duty increased 50 percent.....	3,108.1	116	198.6	116
Per capita national income 75 percent higher than in 1939:				
Duty as in 1939.....	4,061.0	151	234.5	137
Duty reduced 50 percent.....	4,587.5	171	448.6	262
Duty increased 50 percent.....	4,728.2	176	262.5	154
<i>Sundries, free</i>				
1939.....	47.8	100	240.2	100
Post-war long term:				
Per capita national income same as in 1939.....	168.5	353	198.3	83
Per capita national income 75 percent higher than in 1939.....	269.6	564	236.4	98

¹ Does not include the value of domestic production of cut gem stones, known to be considerable, figures for which are not available.

² Includes hides and skins valued at \$20,100,000 and gems valued at \$3,000,000 imported duty-free.

³ Does not include works of art for which no estimates of domestic production, either before or after the war, can be made. If works of art were included in the total imports, the figures would be as follows:

Period and income level	Million dollars	Ratio to 1939
1939.....	233.1	100
Post-war long term:		
Per capita national income same as in 1939.....	207.3	89
Per capita national income 75 percent higher than in 1939.....	281.4	121

In 1939 the production of the dutiable (or partly dutiable) items covered by this group of reports was valued at 2,684.5 million dollars and the foreign value of the imports amounted to 170.9 million. The ratio of the import total to the production total in the table was thus about 6.5 percent, but this figure considerably understates the true ratio of imports to production for the following reasons: (1) The import data are for foreign value and would be increased by perhaps 15 percent if the duties and landing charges were added; (2) the total figure given for production includes a considerable amount of duplication, principally of values for hides and skins, leather, and manufactures made from leather. It is roughly estimated that the duplication involved is about 450 million dollars, excluding which the total value of the domestic production of these dutiable or partly dutiable articles in 1939 would be about 2,230 million dollars. The ratio of imports to production after such adjustments would be 8 or 9 percent. This relatively high ratio of imports to production for the group as a whole is due to the exceptionally high ratios for three major items; namely, bristles, of which there is practically no domestic production; hides and skins, the foreign value of imports of which is equal to about 35 percent of the value of the domestic production;

and gems, for which the value of domestic production (not known) is less than that of imports.

On the other hand, there are several very large items in domestic production of which there are little or no imports, or of which imports are but a small fraction of the enormous domestic consumption. The largest of these include leather footwear (\$727,000,000), rubber tires and tubes (\$485,000,000), leather (\$309,000,000), hats and hat materials (\$130,000,000), dressed or dyed furs (\$110,000,000), and jewelry (\$102,000,000). These items account for nearly 70 percent of the total estimated 1939 value of production for the domestic market of items here included in the dutiable group.

In 1939 the total foreign value of the imports of free articles which are related in their character to the articles dutiable under schedule 15 (not including works of art for which there are no data as to production) was 240 million dollars, and the value of the domestic production 47.8 million, imports, even in terms of foreign value, being more than five times greater than the domestic production. This high ratio is readily understood when it is noted that these imports include the huge item of unmanufactured rubber (of which in 1939 there was only insignificant production in the United States) and the important items of industrial diamonds and unmanufactured cork (of which there is little or no domestic production).

Assuming both national income and duties as in 1939, it is estimated that domestic production of the dutiable (or partly dutiable) items under this schedule, in the long-term post-war period, would exceed the production in 1939 by somewhat more than the growth in population, and that this would also be true of the imports of these articles. In contrast, the estimates indicate (for this income level) far larger domestic production of the related duty-free items in the post-war period than in 1939, accompanied by a marked decrease in imports. The explanation lies chiefly or wholly in rubber. The Commission assumes that part of the domestic synthetic rubber industry created during the war will continue in operation in the post-war period, and that imports of rubber will consequently be smaller (possibly a great deal smaller) than before the war unless national income rises sharply. As will be noted in the report on rubber, the Commission has made estimates of production and imports on several different assumptions with respect to the ratio between the two as it may be affected by governmental policy or by competitive conditions. The totals for the estimates of production and imports of duty-free articles as given in the table above include figures for rubber on the intermediate assumption made by the Commission, namely that the domestic production and the imports will be equal.

It is estimated that with national income 75 percent higher than in 1939, and with no change in duties, the domestic production of the dutiable and partly dutiable items covered by schedule 15 will exceed the production at the lower income level by about 50 percent, while the imports at the higher income level will probably exceed those at the lower level by more than 70 percent. Many of the imports under schedule 15 are essentially luxury articles, the consumption of which is particularly affected by high income. High income would also have a powerful effect upon domestic production and imports of the duty-free items.

The estimates of the Commission indicate that for the articles dutiable under this schedule, the effect of a 50-percent increase or decrease in duties upon the value of imports would be less marked than in some of the other schedules; with no change in the national income, it is estimated that in the post-war period the imports at the reduced rates of duty would exceed those at the 1939 rates of duty by about 30 percent. This is what would be expected in view of the fact that the totals given for dutiable articles include two big items containing a large proportion of the duty-free imports and the fact that the rates of duty on the dutiable part of these two items, as well as the rate on bristles (another important item) are low.

As pointed out in the general introduction, the summary estimates in the above tabulation are subject to an appreciable margin of error. However, the number of items in the dutiable list is large, and the offsetting of errors in the estimates for the individual items may result in totals with a relatively moderate margin of error. As regards the duty-free articles, the dominance of two items, unmanufactured rubber and undressed furs, makes the possible margin of error in the combined estimates of post-war imports considerably larger.

TABLE-TENNIS BALLS

Tariff paragraph: 1509.
Commodity: Table-tennis balls.
Rate of duty: 20% ad val.

Note.—The rate fixed in the Tariff Act of 1930 was 30 percent ad valorem, which was reduced to 20 percent, effective January 1, 1933, pursuant to the United Kingdom trade agreement.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export			
Quantity (thousands).....	1 900	None	8, 746	9, 646	Percent 91
Value (\$1,000).....	1 80		7 708		
Unit value (each).....			\$9. 0217		
Persons employed (number).....	1 80				

¹ Estimated.
² Foreign value.

The balls used in the game of table tennis are made of cellulose nitrate. Only in recent years have domestic manufacturers succeeded in making balls of the high quality generally used in the United States. For this reason domestic production in the past has been insignificant in comparison with imports. Despite improvement that has been made, the bulk of the balls that will be produced in the United States for some time after the war will probably still be inferior to the British and French, and imports will probably continue to satisfy most of United States requirements. Consumption in the post-war period will depend very largely on the increase in population, shorter working hours and more leisure for recreation, and the size of the national

income. Neither consumption nor imports of table-tennis balls are likely to be materially affected by a 50-percent change in the present rate of duty.

POST-WAR SHORT TERM

With the higher level of income, as compared with 1939, in the years immediately following the war, consumption may be about 15 percent higher than in 1939, representing an increase from about 9.5 million to about 11 million balls. Imports will probably continue to supply more than 90 percent of the total, in which case they would amount to about 10 million balls valued at about \$110,000.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

At the 1939 per capita income level, allowing for some increase in the popularity of the game and an increase in population, consumption of table-tennis balls might be about the same as for the immediate post-war period (i. e. about 11 million balls), assuming the increase in population and other favoring factors to be offset by a national income lower than in the immediate post-war period. Domestic production might improve in quality and might increase considerably in quantity; but, unless there should be marked progress in this respect, the maximum figure would probably be less than 2 million balls, valued at approximately \$80,000, and imports would supply about 9 million balls valued at about \$105,000, or even more.

Per capita income 75 percent higher than in 1939.

Consumption of table-tennis balls under a higher national income might be as much as 50 percent greater than in 1939, or in the neighborhood of 14 million balls.

Domestic production and imports would probably supply about the same proportions of consumption under a high national income as under a national income at 1939 level. If so, production might, at the maximum, be 2.5 million balls, valued at about \$125,000, and imports would probably be not less than about 12 million balls, the value of which, allowing for a 25-percent increase in prices, would be in the neighborhood of \$175,000.

Exports

Exports of table-tennis balls are not separately classified in statistics. According to trade information exports have been small, consisting principally of balls packed as part of table-tennis sets and sent to countries where United States citizens reside. It is not expected that exports will be significant in the future.

Employment

The number of persons employed in making table-tennis balls in the United States is small. In 1939 it is estimated that only about 80 persons were employed in this work. Even under an increased national income, with improvement in the quality of the domestic product and an increased duty, employment would still be less than 200 workers.

GOLF, LAWN-TENNIS, AND OTHER ATHLETIC BALLS OF RUBBER

Tariff paragraph: 1502.

Commodity: Golf, lawn-tennis, and other athletic balls of rubber.

Rates of duty: Golf and lawn-tennis balls, 20%; all others, 30%.

Note.—The rate fixed in the Tariff Act of 1930 on all athletic rubber balls was 30 percent ad valorem. The rate was reduced to 20 percent on golf and lawn-tennis balls, effective January 1, 1939, pursuant to trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption.	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000).....	44,583	1,417	44,166	4,478	48,644	Percent
Value (\$1,000).....	7,256	189	17,169	1,278		
Unit value (each).....	\$0.163	\$0.213	\$0.182	\$0.682		
Persons employed (number).....	1,400					

¹ Estimated.

² Foreign value.

The most important of the athletic balls discussed here are golf balls, which account for about 75 percent of the value of domestic consumption, and tennis balls, which account for more than 20 percent. Other athletic balls of rubber consist principally of beach and handballs. The domestic consumption of all these athletic balls is considerably affected by changes in national income.

In 1939, on the basis of quantity, about 2 percent of the golf balls, 13 percent of the tennis balls, and 50 percent of the other athletic balls used in the United States were imported. Imports of golf and tennis balls consisted largely of low-priced balls, whereas those imported in the years before 1937 were principally of higher-priced types. In the same year golf balls constituted about 15 percent of the quantity and 24 percent of the value of imports under this tariff classification; tennis balls 24 percent by quantity and 42 percent by value; and other balls 61 percent and 34 percent respectively. The United Kingdom supplied practically all the imported golf and tennis balls, and Japan supplied most of the other athletic balls.

POST-WAR SHORT TERM

Consumption of athletic balls might be materially greater than in 1939 because of the increase in population and the relatively high per capita income which will probably carry over into this period. In addition, there will be need for replenishing the depleted stocks of wholesalers, retailers, and consumers, so that requirements for some time after the war are likely to be abnormally high. It is likely that the United Kingdom will reenter the United States market as soon as possible after the war. With the increased domestic demand both for restocking and for consumption, imports will probably be somewhat greater than they were in 1939, perhaps considerably greater if adequate supplies are available in England for export to the United States.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of athletic balls might be 25 percent greater than in 1939, or about 60 million. In addition to an increase in population, there will probably be much greater participation in these games than in 1939.

Duty as in 1939.—Imports might amount to as much as 5½ million balls, with a foreign value of about \$350,000. Production for the domestic market would probably supply about the same proportion of consumption as in 1939, or about 54½ million balls, valued at about 9 million dollars.

Duty reduced by 50 percent.—A reduction in duty would substantially affect imports, chiefly of the lower priced balls, which constitute the bulk of the imports. They might amount to as much as 9 million balls, with a foreign value of \$500,000. Production for the domestic market would then supply only about 51 million balls, valued at about 8¼ million dollars.

Duty increased by 50 percent.—Imports might amount to about 3 million balls, with a foreign value of about \$200,000. Production for the domestic market would then amount to about 57 million balls, valued at about 9.5 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption would increase greatly under a higher per capita income, probably by as much as 75 percent. In addition to a larger population there would probably be more leisure time in which to enjoy sports such as golf and tennis. Consumption might therefore amount to as much as 105 million balls. Prices might increase in roughly the same proportion as the rise in the general price level. The following estimates are based on the assumption that the ratio of imports to consumption would be the same as under the lower income.

Duty as in 1939.—Imports would probably amount to about 9¼ million balls, with a foreign value at somewhat higher prices of about \$650,000. Production for the domestic market might then be about 95½ million balls, valued at about 18 million dollars.

Duty reduced by 50 percent.—Imports might amount to approximately 15¼ million balls, with a foreign value of about 1 million dollars. Production for domestic market would then be about 89¼ million balls, with a value of about 17 million dollars.

Duty increased by 50 percent.—Imports might amount to about 5¼ million balls, with a foreign value of about \$400,000. Production for domestic market then would be in the neighborhood of 99¼ million balls, valued at about 19 million dollars.

Exports

In 1939 United States exports of golf balls, as well as other athletic balls, went principally to the Philippine Islands and to Cuba and other Latin-American countries. As the size of the golf ball used in England varies somewhat from that used in the United States, domestic producers have not been able to build up much of an export market in British-controlled areas. It is probable that after the war there will

be a substantial increase in exports of tennis balls and other types of athletic balls to Latin America, as well as to many other parts of the world. Exports may range from \$100,000 to \$250,000, depending on the level of world income.

Employment

Assuming the same ratio of employment to production as in 1939, the number of workers engaged in the production of athletic balls in the long-term post-war period might range from 1,600 to 3,000, on the basis of the above minimum and maximum estimates of production.

ICE SKATES AND PARTS

Tariff paragraph: 1609,
Commodity: Ice skates and parts.
Rate of duty: 15% ad valorem.

Note:—The rate fixed in the Tariff Act of 1930 was 20 percent ad valorem, which was reduced to 15 percent pursuant to the trade agreement with Canada, effective January 1, 1938. The reduced rate is continued pursuant to the second Canadian agreement.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pairs).....	1,139	1,494	1,623	Percent 91
Value (\$1,000).....	1,644	1,873		
Unit value (per pair).....	\$1.44	\$1.25		

¹ Based on Canadian exports to the United States in 1939. Statistics of United States imports on basis of quantity are not reported.

² Foreign value.

Most of the ice skates sold in the United States have shoes attached, but the value of the shoes is not included in the above statistics of production and imports. Skates for temporary attachment to shoes, by use of straps or clamps, are still manufactured but in decreasing quantities. Ice-skate parts sold in the United States are for clamp skates and usually fit only the particular brand for which they are designed.

Imports of ice skates have come almost entirely from Canada; only negligible quantities have come from Germany, Sweden, and the United Kingdom. Imports from Canada have consisted mainly of low- to medium-priced skates, most of which are attached to American-made shoes in the United States.

Reflecting the semiluxury character of ice skates, domestic production as well as imports have fluctuated generally with national income. However, in recent years, because of greater artificial-ice rink facilities, both publicly and privately sponsored, ice skating has become increasingly popular in the United States.

POST-WAR SHORT TERM

The higher level of income and a considerable backlog of demand will probably increase consumption considerably over the 1939 level.

Imports and domestic production would probably supply about the same proportions of consumption as they did before the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

At the 1939 per capita income and allowing for increased popularity of ice skating and an increase in the population, consumption of ice skates might be about 20 percent above the 1939 level, or in the neighborhood of 2 million pairs. Changes of 50 percent in the duty would have only a slight effect on consumption.

Duty as in 1939.—United States production and imports may be expected to supply about the same proportion of consumption as in 1939. Production would then amount to about 1.4 million pairs valued (at approximately 1939 prices) at nearly 2.3 million dollars, and imports would be about 600,000 pairs with a foreign value of about \$450,000.

Duty reduced by 50 percent.—Imports might increase to about three-fourths million pairs with a foreign value of more than \$500,000. If so, domestic production would be correspondingly reduced, amounting to about 1¼ million pairs valued at approximately 2 million dollars.

Duty increased by 50 percent.—Imports would probably not exceed the 1939 level of about 600,000 pairs, the foreign value of which would be about \$375,000. Domestic production would probably be about 1¼ million pairs valued at about 2¼ million dollars.

Per capita income 75 percent higher than in 1939.

Consumption might be as much as 30 percent larger than with income as in 1939, or about 2.6 million pairs. Prices might be expected to increase by about the same percentage as the general price level. Domestic production might perhaps increase more than proportionately because of the inclination, under a higher income, to purchase higher priced domestic skates, but the effect is so uncertain that it is not taken into consideration in the estimates below.

Duty as in 1939.—If imports should supply about the same proportion of consumption as in 1939, they would amount to about 800,000 pairs with a value, at higher foreign prices, of about \$700,000. Domestic production would thus be in the neighborhood of 1.8 million pairs valued at about 3.3 million dollars.

Duty reduced by 50 percent.—The ratio of imports to consumption would probably increase to 35–40 percent. Imports might amount to about 1 million pairs with a foreign value, at increased prices, of about \$850,000. If so, domestic production would amount to about 1.6 million pairs valued at about 3 million dollars.

Duty increased by 50 percent.—The ratio of imports to consumption might be about 25 percent; imports would then be in the neighborhood of 600,000 pairs with a foreign value, at increased prices, in excess of \$500,000. Domestic production would then amount to about 2 million pairs, valued at about 3.8 million dollars.

Exports

Exports of ice skates are not separately shown in United States statistics, but it is known that the quantity shipped abroad is negligible.

BEADS AND BEADED ARTICLES (EXCLUDING IMITATION PEARLS)

Tariff paragraph: 1508.

Commodity:

Spangles and beads (other than imitation pearls), including bugles; and fabrics and articles wholly or in chief value of beads (other than imitation pearl beads, beads in imitation of precious or semiprecious stones, and beads in chief value of synthetic resin) or spangles, not ornamented with beads, spangles, or bugles, nor embroidered, tamboured, appliqued, or scalloped.

Rate of duty: 35%-75% ad valorem; average for 1939, 38.2%.

Note.—The rates indicated are those which were fixed in the Tariff Act of 1930. Reduced rates were in effect on spangles and beads and on certain articles in chief value of beads, from April 16, 1938, to April 21, 1939, inclusive, pursuant to the trade agreement with Czechoslovakia.

GENERAL

The value of United States imports (apparent consumption) for 1939¹ was as follows:

<i>Article</i>	<i>Value</i> ¹ (1,000 dollars)
Beads.....	565
Fabrics and articles of beads.....	339
Total.....	904

¹ Foreign value.

The beads here under consideration are made from a variety of materials, the most important of which are glass, wood, galalith, and metal. They are used principally in jewelry, rosaries, beaded bags, and similar articles, and for the ornamentation of wearing apparel. Bugles are elongated glass beads, usually of very small diameter. Spangles are small shiny disks of gelatin, metal, or plastic. Bugles and spangles are used chiefly for decorative purposes on wearing apparel.

United States requirements for beads and articles composed of beads are met almost entirely by imports. Although statistics are not available, domestic production is known to be small. It is confined mostly to the larger sizes and more expensive types of beads. In some years imports of beads have greatly exceeded imports of beaded articles, and, in other years, the reverse has been true. A large part of the imported articles composed of beads has consisted of beaded handbags.

Total imports of beads and fabrics and articles of beads declined from a foreign value of 8.5 million dollars in 1924 to 4.6 million dollars in 1929 and to 1 million dollars in 1933. Imports advanced only slightly until 1937 and 1938, when they were about 1.9 million dollars annually. In 1939 they declined 50 percent, probably largely by reason of the disturbed conditions of production in Czechoslovakia, which has been by far the principal source of imports; France, Germany, and Japan have been less important suppliers.

The domestic consumption of beads and beaded articles is greatly affected by prevailing fashions, and, to a less extent, by the level of national income. Although the correlation between national income and imports of beads and beaded articles has not been pronounced, statistics indicate that there is a general relation between the two.

¹ 1939 was not a representative year for imports (see discussion). There may have been some domestic production, but it is believed to have been very small; exports are negligible.

POST-WAR SHORT TERM

During the war imports have almost ceased and dealers' stocks have become virtually exhausted. If sufficient foreign supplies are available—a condition which can hardly be forecast—imports in the immediate post-war period will probably be larger than before the war, if only to replenish inventories (average imports for the 3 years preceding the war was about 1.7 million dollars).

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Changes in the rates of duty would probably have only slight effect on the quantity or value of imports or on the small domestic production. During 1931-39, imports ranged from 1 to 4 million dollars annually, averaging 1.7 million, and it may be assumed that with national income at 1939 levels the foreign value of imports might be somewhat above that average, which included depression years. Allowing also for population increase, imports (subject to the vagaries of fashion) might be in the neighborhood of 2 million dollars. Should fashion favor an increase in the use of beads, however, imports might reach much higher levels; should they become less fashionable, imports might be materially smaller.

Per capita income 75 percent higher than in 1939.

A large increase in per capita income would probably result in a substantial increase in consumption of beads and beaded articles, as well as some increase in the foreign unit value of imports. In this event imports might amount to 4-6 million dollars although they could be much larger or smaller, depending on prevailing fashions.

Exports

Exports of beads and beaded articles have been negligible and will probably be small in the post-war period.

HATS AND HAT MATERIALS OTHER THAN WOOL-FELT AND CLOTH

Tariff paragraph: 1504, 1526 (a), and 1529 (a).

Commodity: Hats and hat materials other than wool-felt and fabric.

Rate of duty: Various.

Equivalent ad valorem (1939): 12½% to 257% (average, 30%).

NOTE.—Rates of duty under the Tariff Act of 1930 on the numerous items covered by this report are too varied for individual specification here. The rates on many of the items have been reduced since 1930 by Presidential proclamation under section 336 of the tariff act and pursuant to trade agreements with various countries.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000)	130,647	921	129,726	110,300	140,026	Percent 7.4
Persons employed (number)	18,800					

¹ Estimated landed value; foreign value was 7.5 million dollars.

² Estimated.

Domestic production and imports in 1939 of the various classes of products covered by tariff paragraphs 1504, 1526 (a), and 1529 (a) are shown in the following tabulation:

Tariff paragraph	Kind	Imports		Production		
		Foreign value	Percent of total	Value	Percent of total	
		<i>1,000 dollars</i>		<i>1,000 dollars</i>		
1504 (a)	} Hat braids of all kinds.....	1,348	44.7	(1)		
1529 (a)						
1504 (b)		"Straw" hats and hat bodies, including harvest hats.	5,822	51.1	\$ 45,100	34.5
1526 (a)		Fur-felt hats and hat bodies.....	311	4.2	88,647	66.5
	Total.....	7,479	100.0	133,647	100.0	

¹ Domestic production is not available, but it is known to be negligible in relation to imports.

² Made almost entirely from imported materials; therefore, it includes part of the value of imports shown in the left-hand column.

The hat braids included in the foregoing statistics of imports consisted in large part of braids of natural fibers such as straw and hemp, which are not produced in the United States; hat braids of natural fibers, such as hemp and ramie, in combination with synthetic textile, constituted a substantial portion of imports, but braids wholly of synthetic textile made up only a small part. Braids wholly or partly of synthetic textiles were produced in the United States, but in negligible proportions in comparison with imports. All hat braids are sewn in domestic factories to make finished hats for men and women. During the war, chiefly because imported braids were not available in the usual quantities, the domestic production of synthetic textile braids has increased substantially. The rates of duty on the various kinds of hat braids range from 15 to 257 percent, the bulk being dutiable at 15-22½ percent. Pre-war imports came principally from China, Japan, Italy, and Switzerland.

The "straw" hats and hat bodies included in the foregoing statistics include a variety of headwear for men and women—panamas, ball-buntles, Toyos (paper), stiff sewed braid hats for men, and harvest hats. The great bulk of imports consist of rough hat bodies, including harvest-hat bodies, that require bleaching or dyeing, as well as blocking and trimming, in the United States. Very few finished "straw" hats, either for men or women, are imported. Imports of hat bodies are chiefly from Ecuador, China, Japan, the Philippine Islands, the Netherlands East Indies, and Italy. The duties on "straw" hats and hat bodies range from 25 percent for unfinished bodies to about 70 percent for finished hats. The bulk of the imports are dutiable at the lower rate.

A decrease in the duties on natural-fiber hat braids and rough "straw" hat bodies would have no appreciable effect on imports, because these materials are not produced in the United States and the present duties are not restrictive. A decrease in the duties on hat braids containing synthetic textile or made wholly of synthetic textile would probably stimulate imports. A decrease in the duty on finished "straw" hats would stimulate imports considerably, particularly men's sewed braid hats, which were imported in substantial quantities prior to the increase rates of duty in the Tariff Act of 1930. An increase in

the duty on hat braids or rough "straw" hat bodies would restrict imports and make it difficult for the domestic hat and millinery industries to obtain suitable materials in adequate quantities for making summer headwear. An increase in the duty on finished "straw" hats would probably reduce imports to negligible quantities.

Imports of fur-felt hats and hat bodies consist largely of men's finished hats from the United Kingdom, France, and Italy, and rough hat bodies for women's hats, principally from Czechoslovakia, Austria, and France.

Imports of men's finished fur-felt hats, which are negligible in comparison with domestic production of hats of comparable quality, are for the most part high-priced and have prestige value in the United States market. In 1939 the ad valorem equivalent of the duties in the various value brackets ranged from 44 to 74 percent. A decrease in the duties on finished fur-felt hats would probably stimulate imports considerably and would affect domestic production of comparable grades and qualities by a corresponding quantity, but an increase in the duties would have only slight effect on imports or production.

Imports of rough fur-felt hat bodies for women's hats consist largely of high-quality bodies with special finishes, such as velour and suede, which are converted in the domestic millinery industry into high-priced hats. Comparable finishes can be obtained in the domestic fur-felt-hat industry, but the cost is considerably higher than for imported hat bodies. The equivalent ad valorem of the duties in the various value brackets on these hats bodies in 1939 ranged from 35 to 77 percent. A 50-percent decrease in the duties would undoubtedly stimulate imports and increase consumption, but would probably not affect domestic production materially, because the domestic industry has never specialized in this type of hat body. A 50-percent increase in duties might be expected to curtail imports very slightly.

POST-WAR SHORT TERM

Domestic consumption of hats and hat materials, other than wool-felt and fabric will probably be substantially above the 1939 level.

Imports of the various kinds of braids and unfinished hats (harvest and woven-body hats) may be slightly larger than in 1939. Production of these may be resumed quickly after the war because, for the most part, these materials are made by hand. Imports of finished hats, which are generally produced in factories and require a number of machine operations, may be somewhat below the 1939 level because of impaired production facilities in some foreign countries that were sources of supply.

POST-WAR LONG TERM

Consumption, Production, and Imports

Imports of hats and hat materials were much larger under the duties of the act of 1922 than under the act of 1930. This has been especially true of finished hats, the duties on which were increased substantially in the 1930 act.

Per capita income at 1939 level.

The per capita consumption of hats and hat materials would probably be about the same as in 1939, but the increase in population would result in an increase of about 10 percent in consumption,

which might amount to about 155 million dollars. Consumption would be somewhat affected by a change of 50 percent in rates of duty, but the extent of this effect cannot be closely estimated and consequently no adjustments of consumption are made for change in duty levels in the following estimates.

Duty as in 1939.—Both production for domestic consumption and imports would probably be about 10 percent greater than in 1939; such production might be about 144 million dollars, and the landed cost of imports about 11 million dollars (foreign value, about 8 million dollars).

Duty reduced by 50 percent.—A reduction in duty would probably have only slight effect on imports of "straw" braids and rough hat bodies, but would probably stimulate considerably the imports of finished "straw" and fur-felt hats and of rough fur-felt hat bodies. For the group as a whole the ratio of imports to consumption might rise to about 10 percent (instead of 7 percent with unchanged duties), in which case the landed value of imports would be in the neighborhood of 15 million dollars and the foreign value about 12 million dollars. The value of production for the domestic market would be about 140 million dollars.

Duty increased by 50 percent.—With a 50-percent increase in duties it would be difficult for foreign countries to maintain their normal export trade in the United States without lowering their prices to absorb at least a part of the duty increase. The value of imports might thus be considerably smaller than in 1939. The value of production for the domestic market might be about 146 million dollars, and the landed value of imports about 9 million dollars (foreign value, about 6 million dollars).

Per capita income 75 percent higher than in 1939.

The consumption of hats and hat materials, under higher income, would probably be 50–60 percent greater, in value, than with income as in 1939. This would include a price increase of 10–15 percent, or about equal to the rise in the general price level under a higher national income. With increased per capita purchasing power there would probably be a decided shift from wool-felt to the higher-priced fur-felt hats. The value of consumption might thus amount to as much as 240 million dollars.

Duty as in 1939.—It may be assumed that there would be a slightly higher ratio of imports to consumption than with income as in 1939. At higher income levels there would be a greater demand for high-quality foreign hats and for specialty braids and hat materials. The value of production for the domestic market might amount to about 220 million dollars and the landed value of imports might be about 20 million dollars (foreign value about 14 million dollars).

Duty reduced by 50 percent.—Imports would probably be much larger than with no change in duty. A reduction would, however, have less effect on imports of hat braids and rough straw hat bodies than on finished fur-felt and straw hats and fur-felt hat bodies for women's hats on which the duty is restrictive.

The ratio of imports to domestic consumption might amount to 12 percent; if so, the value of imports (landed cost) would be about 30 million dollars and the foreign value would be about 25 million dollars. Production for the domestic market under this assumption would amount to about 210 million dollars.

Duty increased by 50 percent.—The landed value of imports might be about 10 million dollars (7 million dollars, foreign value) and the value of production for the domestic market might amount to about 230 million dollars.

Exports

United States exports of hats and hat materials herein considered are reported under many classifications. In 1939 the value of these exports of hats and hat materials, other than wool-felt and cloth, was \$921,000, or about 0.7 percent of the value of production. Exports consisted almost entirely of hats, the principal kinds being men's fur-felt hats (including fur-felt bodies), \$354,000; women's and girls' fur-felt hats (including fur-felt berets, bonnets, hood and hat bodies), \$123,000; and hats of straw, palm leaf, and so forth, \$380,000. Exports of hat braids of natural fiber or synthetic textiles were valued at only \$64,000.

In the post-war short term exports may almost equal the 1939 level. In the post-war long term, the value of exports will probably be somewhat below the 1939 level if incomes and duties are as in 1939—possibly about \$500,000. If the world income level is high, and the world level of duties and other trade barriers is reduced by 50 percent, the value may be about 60 percent above the 1939 level and may total 1.5 million dollars.

Employment

On the basis of the above estimated production, employment in the long-term period would probably be 14,000–20,000 persons, depending on the income level and rates of duty.

TOOTH BRUSHES AND OTHER TOILET BRUSHES

Tariff paragraph: 1506.

Commodity: Tooth brushes and other toilet brushes.

Rates of duty: 2¢ each and 50% ad val.; 1¢ each and 50% ad val.; 1¢ each and 25% ad val.; 30% ad val. *Equivalent ad valorem (1939):* 92% (average).

NOTE.—The duties of 2 cents each and 50 percent, and of 1 cent each and 50 percent were provided in the Tariff Act of 1930. The rate of 1 cent each and 25 percent and the rate of 30 percent were provided under the trade agreement with the United Kingdom, effective January 1, 1939; the corresponding rates in the Tariff Act of 1930 were respectively 1 cent each and 50 percent, and 60 percent. In 1939 the percentage equivalents of the compound rates of duty included herein ranged from 20 percent on toilet brushes with handles or backs of materials other than celluloid, to 135 percent on tooth brushes having celluloid handles.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 dozen).....		407		812		<i>Percent</i>
Value (\$1,000).....	13,501	752	12,749	1,640	13,400	5
Unit value (per dozen).....		\$1.85		\$0.38		
Persons employed (number).....	1,200					

¹ Estimated landed value; foreign value was \$308,000.

² Estimated.

In 1939, tooth brushes accounted for 57 percent of the value and 80 percent of the quantity of imports of all tooth and toilet brushes, and for 58 percent of the value and 60 percent of the estimated quantity of the domestic production of such brushes. Toilet brushes other than tooth brushes consist principally of hair, shaving, and nail brushes. Although the ratio of imports to consumption, based on an estimated landed cost of imports, was about 5 percent in 1939, it is estimated that the ratio of imports to consumption on a quantity basis would have been about 10 percent.

Although about 98 percent of the quantity of imports in 1939 were from Japan, this source accounted for only about 74 percent of the imports by value. Imports from Japan consisted largely of brushes with handles or backs of celluloid, the bulk of which retailed in the United States for 10 cents each. Included also were some tooth brushes with handles of bamboo which retailed in the United States for less than 10 cents each. The remaining 2 percent of the quantity and 25 percent of the value consisted of high-quality tooth brushes from the United Kingdom and France.

In contrast to imports, which consisted very largely of low-priced tooth brushes, about one-half of the domestic output of brushes in 1939 and earlier years consisted of medium- and high-priced tooth and toilet brushes and about one-half of low-priced or 10-cent tooth brushes. Exports in pre-war years consisted of high-quality hair and other toilet brushes. When imports of low-priced brushes from Japan ceased with the outbreak of the war, the domestic industry discontinued making that type. Since then, only medium- and high-priced brushes have been available in the United States market. Since 1939 there has been a decided shift in the domestic industry from the use of celluloid or wood for handles or backs of brushes. Cellulose acetate and synthetic resin plastics, such as lucite and plexiglass, are being used widely for this purpose. Nylon filaments are being used in place of bristles, partly because of the shortage and high price of imported bristles, and partly because nylon fibers are proving very satisfactory in various kinds of brushes.

There is considerable uncertainty as to the extent to which these wartime changes will affect future consumption, production, and imports of tooth and toilet brushes. It is probable that after the war many of the brushes in demand will be made of the plastics referred to above, and that in the post-war period such materials may not be readily available to brush manufacturers in Japan. The brushes of the new plastics seem to be well established in popular favor; the handles or backs have a better appearance; and nylon is more durable than bristles.

There will, however, probably be a considerable post-war demand for bristle brushes. Some persons claim that nylon, when used in tooth brushes is too stiff and, as it has no "flag" or split end, such as is found in natural bristles, that it does not clean the teeth so well; many persons are said to prefer bristles in hair brushes because they are softer than nylon. Besides, with the considerable potential demand on the part of consumers for 10-cent tooth brushes and other toilet brushes, the relation between prices of the imported and the domestic brushes will still be a factor.

It seems likely, therefore, that some domestic tooth and toilet brushes will be made of nylon and others of bristles, and that most

imports will be bristle brushes. United States patent control will probably greatly restrict the use of nylon after the war for brush-making in foreign countries. When and if important quantities of bristle brushes are again imported from Japan to retail at 10 cents each, it is probable that similarly priced brushes will again be made in the domestic industry.

The proportions in which nylon and bristles will be utilized in the post-war short and long terms are not predictable. For this reason much uncertainty exists as to total consumption and the extent of competition between domestic and imported products. If nylon should displace bristles to any considerable extent, over-all consumption would also be materially affected because of the greater durability of nylon.

POST-WAR SHORT TERM

It seems unlikely that the quantity of imports in the first few years after the war will attain the level of 1939. Imports will probably be confined principally to small quantities of more expensive brushes, chiefly from the United Kingdom and France. Domestic production in this period will probably be at about the 1939 level.

POST-WAR LONG TERM

Consumption, Production, and Imports

It is here assumed that Japan will again be a major factor in this trade. Because of low foreign value, the retail prices of imported low-grade brushes generally are not likely to be different under a 50-percent reduction in duties from what they would be under 1939 duties; usually, they would still be 10 cents. The lower duty, however, would mean increased profit to the importers, who would try to stimulate sales by various means other than reducing prices, and therefore the imports might be somewhat greater than if the duties were unchanged. Duties 50 percent higher than those in effect in 1939 might have the effect of practically eliminating imports of cheap Japanese brushes; such higher duties would make it unprofitable to retail them at 10 cents and at higher prices they could not, in general, compete with domestic brushes.

It is not believed that the value of consumption would be appreciably affected by the postulated change in duties. Because of the recent changes in the materials that are used in making brushes, however, the value of consumption in the future is very uncertain. Moreover, since the use of nylon by domestic manufacturers may alter to an important degree the competition between imported and domestic brushes in the future, the estimates given below are probably subject to a greater margin of error than the estimates for many other commodities.

Per capita income at 1939 level.

The increase in population and the trend toward larger use of tooth and toilet brushes resulting from greater attention to dental hygiene might approximately offset any decline in production that would result from wider use of nylon brushes and their greater durability. Total consumption might, therefore, remain at about the 1939 level, or in the neighborhood of 14 million dollars.

Duty as in 1939.—With no change in the duties, imports might supply about the same proportion of consumption as in 1939, about 5 percent. The landed value of imports would thus amount to about \$700,000 (foreign value about \$360,000), and the value of production for the domestic market would amount to about 13.3 million dollars.

Duty reduced by 50 percent.—Such reduction in duties would stimulate imports, not only in the low-priced field but possibly to a greater extent, relatively, in high-priced specialty brushes which have come in principally from the United Kingdom and France. Imports might supply about 10 percent of consumption; if so, the landed value of imports would be about 1.4 million dollars (foreign value about \$900,000). The value of production for the domestic market would then be about 12.6 million dollars.

Duty increased by 50 percent.—Such increase in duties would probably reduce imports greatly; the landed value might not be more than \$100,000 (foreign value about \$40,000), and the value of production for the domestic market might be about 13.9 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption might increase, in value, by as much as 40 percent over the level under the 1939 income, including allowance for a price increase about equal to the rise of 10–15 percent in the general price level which would occur under a higher national income. Consumption would amount to about 19 million dollars.

Duty as in 1939.—Assuming that imports would probably supply about the same proportion of consumption as in 1939, i. e., 5 percent, the landed value of imports (at increased prices) would be about \$950,000 (foreign value about \$475,000), and the value of production for the domestic market would be about 18.1 million dollars.

Duty reduced by 50 percent.—If imports should supply as much as 10 percent of domestic consumption, the landed value of imports would be about 1.9 million dollars (foreign value, about 1.3 million dollars) and the value of production for the domestic market would be about 17.1 million dollars.

Duty increased by 50 percent.—The landed value of imports would probably not amount to more than \$300,000 (foreign value, about \$125,000), and the value of production for the domestic market would be about 18.7 million dollars.

Exports

United States exports of tooth and toilet brushes accounted for about 6 percent of the value of the domestic output in pre-war years. It is reasonable to expect that with world income at about the 1939 level, exports in the long-term period would be about the same as in that year or probably a little larger. With a 75-percent increase in world income, exports might increase to 8 or 10 percent of production, or about 1½–1¾ million dollars.

Employment

The number of wage earners in the domestic industry, which in 1939 was about 2,000, would probably vary according to the different conditions stated above, and might range from about 2,200 to, say, 3,000.

HAIR PENCILS

Tariff paragraph: 1506.

Commodity: Hair pencils.

Rate of duty: 2¢ each, but not less than 20% nor more than 40% ad valorem. Equivalent ad valorem (1939): 35%.

NOTE.—The rate in the Tariff Act of 1930 was 40 percent ad valorem. Pursuant to the trade agreement with the United Kingdom, effective January 1, 1939, this rate was changed as shown above.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000).....	49, 938
Value (\$1,000).....	1 193
Unit value (each).....	\$0. 0044

¹ Foreign value.

Hair pencils are small brushes commonly made with wooden, quill, or plastic handles and certain kinds of soft animal hair. High- and medium-grade hair pencils are used for fine painting by artists and art students, show-card writers, sign painters, and furniture and automobile producers. Low-grade hair pencils, which constitute a large proportion of the total consumption of hair pencils in the United States, are used in applying cosmetics; the remainder of the low-grade type is used in school children's paint sets.

Imports supply almost all of our requirements. In 1939 the United Kingdom and France supplied very small quantities of pencils but Japan accounted for 99 percent of the total imports in terms of quantity, and Germany was the chief source on the basis of value. Pencils coming from the United Kingdom and France were of high and medium grades, respectively; those from Japan and Germany were of the lower grades.

No exports of domestic hair pencils have been reported in official statistics, and it is likely that there will be none after the war.

POST-WAR SHORT TERM

It is likely that consumption, practically all of which will be supplied by imports, will be substantially below the 1939 level because of disturbed conditions in Japan and Germany.

POST-WAR LONG TERM

Assuming resumption of trade with Germany and Japan in this item, and taking account of further increase in our population, a substantial increase in United States consumption of hair pencils seems probable. There will be a larger demand for the use of hair pencils in applying cosmetics, in school children's paint sets, and by show-card writers, sign painters, and manufacturers of furniture and automobiles.

Because of the relatively low unit value of these pencils, particularly of the grades comprising the bulk of United States consumption, it is unlikely that a 50-percent reduction or increase in the rates of duty would greatly affect the total quantity imported, but it might affect imports of the higher grades and, consequently, the value of imports.

Per capita income at 1939 level.

Per capita consumption of hair pencils will probably be about the same as in 1939. Allowing for an increase in population and assuming that imports will continue to supply the great bulk of consumption, imports might amount in number to about 48 million, with a foreign value, at 1939 prices, of about \$212,000.

Per capita income 75 percent higher than in 1939.

Under this income level, consumption might be about 50 percent greater in quantity than it was under the 1939 level. Imports might amount to 72 million hair pencils, with a foreign value, at increased prices, of about \$360,000.

BRISTLES

Tariff Paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1507-----	Bristles: Sorted, bunched, or prepared	34 per lb-----	2%
1687-----	Crude, not sorted, bunched, or prepared.	Free.	

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Item	Imports ¹ (apparent consumption)
Quantity (1,000 pounds).....	4,399
Value (\$1,000).....	\$ 6,203
Unit value (per pound).....	\$1.43

¹ After adjustment for reexports of foreign bristles (737,000 pounds valued at \$1,044,000) on which duty was paid.

² Foreign value.

Bristles are the coarse stiff hairs of the hog. United States imports of bristles are nearly always sorted, bunched, or otherwise prepared. No crude bristles were imported in 1939. Bristles are used almost exclusively in the manufacture of brushes.

There was no commercial production of bristles in the United States either in 1939 or in earlier years. Since that time production has been small. The output in 1944 was about 28,000 pounds, an insignificant amount in relation to total United States requirement. The outlook for greater domestic production is unfavorable for several reasons. In the United States most hogs are slaughtered before maturity and the hairs are usually too soft to be classified as bristles. For hogs that have developed bristles, no machinery has yet been devised to take them from the carcass without also removing the soft hairs; the hand-pulling method would be uneconomical because it would slow down the conveyor production system used in packing plants.

Average annual imports in the 1936-39 period which were not reexported were about 4.3 million pounds. In 1939 it was slightly

above this figure. China was the source of at least 90 percent of the world output of bristles before the war; and nearly all of those collected in China and other producing countries were exported, with the United States as the principal market. Since 1941, imports from China have substantially decreased because of war conditions, and United States stocks have fallen considerably below requirements. Imports for consumption not reexported in 1944 amounted to only about 2,500,000 pounds. Increased imports from Western Hemisphere countries during the war have not overcome the deficiency. After the war, it is probable that Chinese bristles will be more plentiful.

It is estimated that in 1939 about 60 percent of the bristles consumed in the United States were used in paint brushes, 20 percent in tooth and other toilet brushes, and 20 percent in industrial and household brushes. Since that year, tapered nylon filaments have been used extensively in paint brushes, and untapered nylon filaments have been employed in tooth brushes and other toilet brushes and in many industrial brushes.

Nylon paint brushes are suitable chiefly for work on rough steel or concrete, although during the war they have been used in painting other surfaces, for which bristle brushes would have been more suitable. More bristles will probably be used after the war in paint brushes than has been the case recently. Many persons prefer bristles to nylon in tooth brushes because bristles are softer, and it is believed that the "flag" or split end cleans the teeth better.

POST-WAR SHORT TERM

The backlog of demand for bristle brushes which is likely to exist in the United States immediately after the war will undoubtedly result in imports of bristles substantially greater than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Per capita consumption will probably be about the same as in 1939. Taking account of an increase in population, total consumption (and imports) might be 10 percent above that of 1939, or about 4.7 million pounds. The foreign value at 1939 prices would be about 6.7 million dollars. Changes of 50 percent in the low duty would not affect imports.

Per capita income 75 percent higher than in 1939.

Imports might be considerably higher than with income as in 1939; the increase in construction that would occur under a higher national income would require considerably more paint brushes, a large part of which would probably be made of bristles. Imports might amount to about 7.7 million pounds, with a foreign value of about 12.6 million dollars. This takes into account a price increase about equal to the rise in the general price level which would occur under a higher national income.

Exports

So far as is known, there are no exports of domestic bristles. Re-exports, which have consisted principally of Chinese bristles, have

been chiefly to the United Kingdom and Canada. Reexports, which in 1939 amounted to 764,000 pounds, or 15 percent of total imports, had a value of about 1 million dollars.

PEARL OR SHELL BUTTONS

Tariff paragraph: 1509.

Commodity: Pearl or shell buttons.

Rate of duty: 1½¢ per line per gross + 25% ad val. *Equivalent ad valorem (1939):* 148% (dutiabie imports only).

NOTE.—Philippine pearl or shell buttons, free of duty under the Tariff Act of 1930, were made subject to a duty-free quota of 800,000 gross in 1940, with provision for successive reductions in that quota in subsequent years until independence. Entries in excess of quotas were made subject to full United States duties (Act of August 7, 1939; 53 Stat. 1226).

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Appar-ent con-sump-tion	Ratio of imports to con-sump-tion
	Total	For ex-port ¹	For domestic market			
Quantity (1,000 gross).....	20,370	580	19,790	1,331	21,121	<i>Percent</i> 6.3
Value (\$1,000).....	8,353	124	8,229	‡ 404		
Unit value (per gross).....	\$0.41	\$0.21	\$0.41	\$0.30		
Persons employed (number).....	‡ 4,000					

¹ Data shown are for 1941. Exports of pearl buttons were not shown separately in 1939.

² Foreign value.

³ Estimated.

Pearl or shell buttons are made from the shells of fresh-water mussels, mother-of-pearl, and other aquatic shells and green snail shells. Imports of pearl or shell buttons are reported under two statistical classes, namely, fresh-water and ocean. In this discussion these two classes will be referred to as pearl buttons. About 40 percent of the imports in 1939 were dutiable and the balance were duty-free, coming from the Philippine Islands. Pearl buttons are used very largely on shirts and underwear. Buttons made from other materials, such as galalith, synthetic resin, and other plastics, have become increasingly competitive with pearl buttons. The considerable waste of material involved in manufacturing pearl buttons, and the relatively large amount of labor required, have been handicaps in meeting this competition. During the war the supply of ocean shells, which comes largely from the Pacific area involved in the war, has been greatly restricted.

The domestic industry comprises about 45 firms employing in the neighborhood of 4,000 persons. About one-third of the firms make fresh-water pearl buttons and are located principally in Iowa; the remainder, which produce ocean-pearl buttons, are located principally in New York, New Jersey, and other Eastern seaboard states. Production in the domestic industry has been declining gradually but steadily since around 1923, when more than 30 million gross were produced. Exports consist of the very lowest grade of button, for

which there is no market in the United States. In making pearl buttons, a certain amount of inferior, low-quality buttons are to be expected because of the varying quality of the shells. These are usually exported for whatever price can be obtained.

The Philippine Islands were the most important source of United States imports for many years before the war; Japan ranked next. Shell buttons imported from Japan consisted in large measure of self-shank buttons of types usually not made in the United States and generally inferior in quality to those produced domestically. In 1939, the average value per unit of imports from Japan was 23 cents, while the average for pearl buttons imported from the Philippine Islands was 36 cents.

POST-WAR SHORT TERM

Consumption will probably remain below the 1939 level for two reasons, namely, a continuation of the trend away from the use of pearl buttons and the lack of an adequate supply of ocean shells. In addition, the supply of fresh-water pearl shells is diminishing. In the first few years following the war, imports of pearl buttons will probably be generally lower than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

In making estimates for the long-term period, it is assumed that imports from the Philippine Islands will be subject to the full United States tariff duties covering pearl buttons.

Per capita income at 1939 level.

There will probably be a continuation of the gradual decrease in the per capita consumption of pearl buttons as a result of increased competition from buttons made of other materials. Even allowing for an increase of 10 percent in population total consumption might be estimated at about 19 million gross (varying somewhat if the duty should be decreased or increased by 50 percent).

Duty as in 1939.—The ratio of imports to consumption would probably be about 4 percent, substantially below the 1939 level, for the reason that imports from the Philippines, formerly free of duty, would probably cease if they are made subject to the duty of 148 percent. The average unit value of imports would also probably be somewhat lower. Thus imports might amount to about 800,000 gross, with a foreign value of about \$200,000. Domestic production would then be about 18.2 million gross, valued at about 7 million dollars.

Duty reduced by 50 percent.—A decrease in the duty would tend to increase the total consumption, perhaps to about 20 million gross. The ratio of imports to consumption might be about 10 percent, inasmuch as imports from Japan of self-shank buttons, and also of other types which could not be imported under the higher duty, would probably increase. Imports might amount to about 2 million gross, with a foreign value of about \$600,000. Domestic production would then be about 18 million gross, valued at about 6.8 million dollars.

Duty increased by 50 percent.—Consumption would probably be slightly smaller than with no change in duty, perhaps about 18½ million gross. Imports would probably decline sharply, probably not exceeding 100,000 gross, with a foreign value about \$20,000. Domestic production would then amount to about 18.4 million gross, valued at about 7½ million dollars.

Per capita income 75 percent higher than in 1939.

An increased per capita income might tend to offset to some degree, at least temporarily, the gradual decline that might otherwise be expected in the use of pearl buttons. Under a higher income, total consumption might be as much as one-sixth greater, with no change in duty, than under the 1939 income level, or in the neighborhood of 22 million gross. Consumption would, however, be affected to some extent by changes in the duties. The competition between buttons made of mother-of-pearl shells and those made of other materials will tend to keep prices from advancing to any considerable extent.

Duty as in 1939.—With imports supplying a somewhat smaller proportion of consumption than in 1939, they would amount to about 900,000 gross, with a foreign value of about \$225,000. Production for the domestic market would then amount to about 21.1 million gross, valued at about 8½ million dollars.

Duty reduced by 50 percent.—Total consumption might increase to about 23 million gross and imports might supply about 2½ million gross, with a foreign value of about \$750,000. Domestic production would then decline to about 20½ million gross, valued at about 8 million dollars.

Duty increased by 50 percent.—Consumption would tend to be smaller under a higher duty than with no change in duty, amounting perhaps to about 21½ million gross. Imports would probably not exceed 200,000 gross, with a foreign value of about \$40,000. In this case, production for the domestic market would be about 21.3 million gross, valued at about 8.7 million dollars.

Exports

Exports have usually been small in relation to domestic production, ranging from about 1 percent to 5 percent of the value. After the war, exports of pearl buttons may be expected to continue for a short time at about the same rate as in 1939. Over a longer period, with large-scale production resumed in the principal foreign producing countries, exports will probably decline from the 1939 level.

Employment

Data are not available showing employment in the pearl-button branch of the button industry. It is estimated that there were about 4,000 persons employed in recent years, and this number is not likely to change materially in the post-war period.

GLASS BUTTONS

Tariff paragraph: 1510.
Commodity: Glass buttons.
Rate of duty: 45% ad val.

NOTE.—Current duty rate is that fixed in the Tariff Act of 1930. During the period April 16, 1938, to April 21, 1939, inclusive, a reduced rate of 25 percent ad valorem was in effect pursuant to the trade agreement with Czechoslovakia; the agreement was suspended April 22, 1939.

GENERAL

Data on United States imports (apparent consumption)¹ for 1939 are given below:

Quantity (1,000 gross).....	711
Value (\$1,000).....	1142
Unit value (per gross).....	\$0.20
Persons employed.....	(¹)

¹ Foreign value.
² Negligible.

Imports of glass buttons in 1939 were unusually low owing chiefly to the unsettled conditions in Czechoslovakia, the principal pre-war source of United States imports. During the 3-year period 1936-38 annual imports averaged about 1.4 million gross, valued at more than \$400,000. Throughout the pre-war period, however, imports had a downward trend. Japan was an unimportant supplier.

Glass buttons, most of which are fancy dress buttons, have never been made in significant volume in this country. The Census report for 1929 (the last year for which this information is available) showed an output of 114,000 gross, valued at \$84,000.

Glass buttons are used exclusively on women's clothing and consumption of them is influenced by fashion trends. Plastic buttons, which simulate glass buttons very closely, are now being made and are being used extensively in place of glass. The effect of this competition was evidenced before the war by declining imports, as noted above. It is believed that plastic buttons will, to a considerable extent, displace glass buttons after the war.

POST-WAR SHORT TERM

Increased production and use of plastic buttons in the United States in recent years and the probable inability of Czechoslovakia, the principal pre-war source of imports, to regain its former position will tend to keep imports in the years immediately following the war substantially below the average of pre-war years. Imports might be at about the 1939 level, which was much below pre-war years.

POST-WAR LONG TERM

Competition of plastic buttons seems likely to result in a continued downward trend in per capita consumption of glass buttons. Nevertheless, it seems probable that imports (and consumption) of glass buttons would be appreciably affected by marked changes in national income and in rates of duty. As related to domestic pro-

¹ Domestic production is very small.

duction, however, such changes would probably be reflected mainly in the production of plastic buttons and not in that of glass buttons, very few of which are produced in the United States.

Per capita income at 1939 level.

Notwithstanding the increase in population, imports might be even less than in 1939 and not exceed 500,000 gross, with a foreign value (at 1939 prices) of about \$100,000. A decrease of 50 percent in the duty might result in imports of about 600,000 gross, valued at \$120,000 (foreign value); an increase of 50 percent in the duty might result in imports of 300,000 gross, valued at \$60,000.

Per capita income 75 percent higher than in 1939.

An increase in per capita income in the United States would probably accentuate the trend from glass to plastic buttons. Plastics are more variegated, easier to handle, and, for any given size or style of button, are not more expensive.

Allowing, however, for some increase in imports of novelty items as a general result of higher income, it is possible that imports might be 20 percent greater than with income as in 1939 and might amount to approximately 600,000 gross, with a foreign value of as much as \$120,000. This figure does not allow for any increase in prices, which would probably remain more or less constant, owing to competition from plastic buttons. With duties reduced by 50 percent, imports might be about 850,000 gross, valued at \$170,000 (foreign value); with duties increased by 50 percent, they might be around 500,000 gross, valued at \$100,000 (foreign value).

GALALITH BUTTONS

Tariff paragraph: 1510.

Commodity: Galalith buttons.

Rate of duty: 45% ad val.

NOTE.—The above rate is that fixed by the Tariff Act of 1930. The rate was reduced to 35 percent from April 16, 1938, to April 21, 1939, inclusive, on galalith buttons valued at more than 60 cents per gross, pursuant to the trade agreement with Czechoslovakia; the agreement suspended April 22, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 gross)	13,828	1,108	13,720	286	14,006	Percent ²
Value (\$1,000)	3,066	24	3,042	117		
Unit value (per gross)	\$0.222	\$0.222	\$0.222	\$0.411		
Persons employed (number)	1,500					

¹ Estimated.

² Foreign value.

Galalith buttons are made from casein in a great variety of colors, shapes, and sizes; they are used for ornamentation as well as for utility. In 1939, galalith buttons ranked third in importance in United States button production, being exceeded only by pearl or

shell and synthetic-resin buttons. Galalith buttons, generally classed as plastics buttons, have increased steadily in importance since 1931. Casein will probably continue to be one of the major materials for button making in the future.

In 1939 and earlier years, imports came principally from Japan, Czechoslovakia, and the United Kingdom; small quantities were also imported from Germany, France, and the Netherlands. Imports from Japan, which accounted for about 64 percent of total imports in 1939, consisted principally of the smaller sizes and cheaper grades. European countries were the sources of the larger, high-quality buttons, valued in 1939 at about \$1.25 per gross, or several times the average price of the United States production. Imports of galalith buttons reached a peak in 1937.

POST-WAR SHORT TERM

Consumption will probably be about the same as in pre-war years. Synthetic-resin plastics buttons have increased in importance during the war, chiefly because of their use for military clothing; and buttons of these materials for civilian clothing may gain in importance. Production of galalith buttons will probably be about the same as in 1939. Imports will probably be lower than in pre-war years.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Per capita consumption would probably be about the same as in 1939. Allowing for an increase in population, total consumption might amount to about 15½ million gross. Consumption might be affected slightly by changes of 50 percent in the rate of duty.

Duty as in 1939.—Imports might furnish about the same proportion of total consumption as in 1939 and might be in the neighborhood of 300,000 gross, with a foreign value of about \$125,000. Production for the domestic market would amount to slightly more than 15 million gross, valued at about 3.3 million dollars.

Duty reduced by 50 percent.—Imports might supply as much as 5 percent of domestic consumption, or about 0.8 million gross, with a foreign value of about \$325,000. Production for the domestic market would be about 14¼ million gross, valued at about 3.2 million dollars.

Duty increased by 50 percent.—Such increase in duty might reduce imports to as few as 100,000 gross, with a foreign value of about \$40,000. If so, production for the domestic market would amount to about 15.4 million gross, valued at about 3.4 million dollars.

Per capita income 75 percent higher than in 1939.

An increase in income would affect consumption only moderately; it might be about 10 percent larger than with income as in 1939, or about 17 million gross. A small increase in prices might be expected, probably about 5 percent, but the competition with buttons made of other materials would tend to keep prices down.

Duty as in 1939.—The proportion supplied by imports might be the same as in 1939; imports would then amount to about 340,000

gross, with a foreign value, at slightly increased prices, of about \$150,000. Production for the domestic market would be in the neighborhood of 16.5 million gross valued at about 3.8 million dollars.

Duty reduced by 50 percent.—Imports might supply as much as 5 percent of consumption, and amount to about 850,000 gross, valued at about \$370,000. Production for the domestic market would then be in the neighborhood of 16 million gross, valued at about 3.7 million dollars.

Duty increased by 50 percent.—Imports would probably not amount to more than 200,000 gross, with a foreign value of about \$85,000. Production for the domestic market would be near 17 million gross, valued at about 3.9 million dollars.

Exports

Statistics are not available showing exports of galalith buttons but it is estimated that they were small in pre-war years, usually amounting to 1 percent or less of domestic production. It is not likely that exports will increase substantially in relation to domestic production in the short- or long-term post-war periods.

Employment

On the basis of the above estimates of production, employment in the long-term post-war period might range from 1,500 to 1,700, depending on the levels of duty and national income.

CORK STOPPERS

Tariff paragraph: 1511.

Commodity: Cork stoppers, of natural or composition cork, and shell corks.

Rates of duty: 10¢, 12½¢, 25¢, 31¢, and 75¢ per lb. (The bulk of the imports in 1939 were dutiable at 25¢ per lb.).

Equivalent ad valorem (1939): 36%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 lbs.).....	(1)	386	(1)	272	(1)	Percent ----- 8
Value (\$1,000).....	3,194	123	3,071	260	3,331	
Unit value (per lb.).....	(1)	\$0.324	(1)	\$0.713		
Persons employed (number).....	800					

¹ Not available; see text.

² Estimated landed value; foreign value was \$194,000.

³ Estimated.

Cork stoppers are one of the important products made from cork. In pre-war years they accounted for about 20 percent of the total value of cork products manufactured in the United States. Stoppers

are made in a great variety of shapes and sizes. They are usually cut from natural cork bark but a small proportion of the total output is made of composition cork; that is, of ground cork mixed with a binding agent such as resin, glue, or gelatin.

The Census Bureau reports the production of corks in the United States in terms of value but not of quantity. The value in 1939 was 3.2 million dollars. The average value per pound of the exports during that year was 32.4 cents. If this average value had been applicable to the total production in the United States, that production would have been approximately 9.8 million pounds. The exports, however, were apparently of lower average unit value than the total domestic production; they were mainly of large corks, while in the domestic production smaller corks, which had a higher value per pound, were relatively more important. It is possible that the domestic production in 1939 did not exceed 7 or 8 million pounds. In the estimates which are hereinafter made regarding consumption and production in the post-war period, only values are given. In order to compare the value of imports with that of domestic production, it is necessary to take account of the value added by duty. The table above shows the duty-paid value of the imports in 1939, but does not allow for any other expenses connected with importation.

Cork stoppers made in the domestic industry cover the entire range in size and quality. On the other hand, most imported stoppers are of large size and high quality. This is due mainly to the fact that the duties are specific, at the same rates per pound on high-priced as on low-priced corks. In 1939, of the total imports of 272,000 pounds, 236,000 consisted of stoppers more than three-quarters of an inch in diameter (at the large end) made from natural cork. The foreign unit value of these large corks in 1939 was 72 cents per pound; since the rate of duty was 25 cents per pound, the ad valorem equivalent was 35 percent. In contrast, the average unit value of corks exported from the United States in 1939 was 32.4 cents per pound. Presumably large quantities of the corks marketed in this country have a value of not more than 40 cents per pound. On any imports of corks produced abroad, of types and grades corresponding to those constituting a large part of the domestic output, the specific rates of duty would have a very high ad valorem equivalent; the rates are virtually prohibitive of imports of medium- and low-priced corks.

Before the war, Spain and Portugal together supplied about 85 percent of the imported stoppers; and France, the United Kingdom, and Italy supplied almost all the remainder. Some of the stoppers imported were manufactured by foreign subsidiaries of United States cork-manufacturing concerns.

Imports of corks have increased more than fourfold during the war as the result of war restrictions on the shipment of raw cork. However, they still constitute a relatively small proportion of the consumption.

POST-WAR SHORT TERM

With the removal of wartime restrictions on the shipment of raw cork, imports of cork stoppers are likely to fall to approximately the same level as in 1939, although by reason of higher national income they may be somewhat greater than in that year.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The value of consumption of cork stoppers on this assumption would probably be about the same as in 1939, namely, about 3.3 million dollars. The effect of increase in population would probably be approximately offset by greater substitution of stoppers made from other materials and by the increased use of containers with other kinds of closures. Changes in price as the result of changes of 50 percent in the duties would probably not be sufficient to affect consumption materially.

The imports of corks into the United States in the post-war period may be affected by intercorporate relationships between domestic and foreign producers, and by agreements and understandings among producers. In the pre-war period the largest domestic producer of corks was also a large (perhaps the largest) manufacturer of corks in Spain and Portugal. Some other domestic manufacturers also had interests in foreign concerns. There may also have been understandings among foreign producers (whether or not including domestic producers as well) as to marketing and prices, although no definite evidence on this point is available.

Although the imports into the United States in 1939 may have been affected to some degree by intercorporate relationships between domestic and foreign producers, it is assumed, in forecasting what would be the imports in the post-war period with income conditions and rate of duty the same as in 1939; that imports will be neither more nor less affected by such arrangements than they were before the war. Moreover, in order to make any significant estimate of the effects of a reduction or increase in the rate of duty, it is necessary either (a) to assume that the only causal factor (apart from the duty) affecting imports will be the comparative domestic and foreign costs of production, or (b) at least to assume that artificial interference with that factor will not be greater with a change in duty than with no change in duty. Otherwise no significant estimates could be made at all. In what follows it is estimated that, for reasons stated, a reduction of 50 percent in the duty would probably greatly increase imports. It is possible, of course, that intercorporate relationships and arrangements among producers might lessen, or even nullify, the effect of the change in duty. Conversely, such relationships and arrangements might lessen or nullify the effect of an increase in the duty in reducing imports.

Duty as in 1939.—Imports would probably be about the same as before the war, say, 275,000 pounds, which at pre-war prices would have a foreign value around \$200,000. Domestic production, not including exports, would probably be about the same as in 1939, say, 3.1 million dollars.

Duty reduced by 50 percent.—Such reduction would make the two most important rates of duty 12½ cents and 15½ cents per pound. This change would probably make it possible for foreign manufacturers to sell in the United States certain types and grades on which the 1939 rate of duty was virtually prohibitive, although it probably would still be impossible for them to sell corks of the lowest price range. The

extent of the increase in imports cannot be estimated with any approach to accuracy, even on the assumption that comparative domestic and foreign costs of production would be the dominant factor in determining the trade. Imports might be twice, or possibly as much as three or four times, as great in quantity as before the war, perhaps ranging from 600,000 pounds to 1.2 million pounds. Such increase in quantity, however, would be accompanied by an appreciable lowering of the average foreign unit value; as compared with 71.3 cents per pound in 1939, it might become as low as 60 cents. The foreign value of the imports might then be between \$360,000 and \$720,000. Such increase in imports would somewhat reduce the domestic production in quantity, and the average unit price of the domestic product might also be lowered slightly. Production for the domestic market might range from 2.6 million to 2.8 million dollars in value.

Duty increased by 50 percent.—Because of the high quality and prestige of the imported stoppers, such increase in the duty would probably reduce imports only moderately. They might fall to perhaps 200,000 pounds, with a foreign value, at prices perhaps somewhat higher than the pre-war average because of the raising of average quality, of about \$150,000. Domestic production would be only slightly larger than with the duty at the 1939 level.

Per capita income 75 percent higher than in 1939.

Consumption of products utilizing cork stoppers is affected materially by the level of income. Consumption might be about one-third greater in quantity than with income as in 1939, and prices might be 10–15 percent higher. The value of consumption might thus be in the neighborhood of 5 million dollars.

Duty as in 1939.—The ratio of imports to consumption would probably not be materially different from that in 1939, say, about 8 percent. Imports might thus amount to about 400,000 pounds, with a foreign value, at prices presumably somewhat higher than in 1939, about \$320,000, and with a duty-paid value of about \$425,000.¹ Domestic production for the home market would then be perhaps 4.6 million dollars.

Duty reduced or increased by 50 percent.—The effects of reducing or increasing the duty by 50 percent would probably be closely parallel with those estimated on the basis of income as before the war.

Summary of estimates.—Assuming consumption to be 13 million pounds under each rate of duty, imports and production, under a per capita income 75 percent greater than in 1939, might be somewhat as follows:

Tariff treatment	Imports			Production for the domestic market—value
	Quantity	Unit value	Foreign value	
Duty as in 1939.....	400 <i>1,000 pounds</i>	\$0.80 <i>Per pound</i>	320 <i>1,000 dollars</i>	4,600 <i>1,000 dollars</i>
Duty reduced by 50 percent.....	800–1,600	.70	560–1,120	3,760–4,025
Duty increased by 50 percent.....	300	.85	255	4,600

¹ Although the foreign corks are more distinctly luxury products than the domestic corks, it is doubtful whether the high national income would cause a greater increase in the use of the foreign corks than in the use of the domestic.

Exports

It is not believed that exports of cork stoppers will continue at the high level maintained since 1939 (about \$250,000 a year). Much of the increase in exports has been the result of temporary shipping advantages enjoyed by producers in this country together with numerous restrictions on foreign competitors.

Employment

Employment might range from 600 under the lowest estimate of production to 1,000 under the highest estimate.

DOLLS AND TOYS

Tariff paragraph: 1513.

Commodity: Dolls, toys, parts of dolls and toys; air rifles. 1¢ each and 60% (114% in 1939); 1¢ each and 50% (103% in 1939); 90%; 70%; 45%. Equivalent ad valorem (1939): 75%.

NOTE.—The rates fixed in the Tariff Act of 1930 on the various toy articles covered by this report were 90 percent, 1 cent each plus 60 percent, 1 cent each plus 50 percent, or 70 percent. Reduction of the 70-percent rate to 45 percent had been made with respect to certain items, effective January 1, 1939, pursuant to agreement with the United Kingdom.

After 1939 the 90-percent rate was reduced to 45 percent and the 70-percent rate was reduced with respect to certain items to 35 percent, effective January 30, 1943, pursuant to trade agreement with Mexico, with reservation of the right to withdraw or modify the reductions after termination of the emergency.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	50,500	3,400	47,100	1,240	149,500	Percent 15
Persons employed (number).....	17,400					

¹ Estimated landed value; foreign value was 1,302 thousand dollars.

² Estimated at 9 percent for the 1936-39 period.

The above statistics and the following statement relate largely to articles used chiefly for the amusement of children. Some dolls and air rifles are not toys but are used by adults: the dolls consist of boudoir and collectors' items; certain air rifles are used for shooting small game. Imports, which are reported under 26 statistical classifications, were abnormally low in 1939; for the 5-year period 1936-39 they averaged about 2.2 million dollars (foreign value).

Most of the pre-war imports consisted of low-quality Japanese or German dolls and toys which retailed at 10-25 cents each. These articles were of such construction that they usually lasted only a short time. Domestic dolls and toys were generally more durable. In the low-priced field which consisted of toys retailing at 10-25 cents each, imports accounted for a much larger percentage of consumption

than in the medium- or high-priced fields. An indication of the importance of the various classes of imports covered by this statement is given in the following tabulation of imports for 1939:

Article	Foreign value	Rate of duty	Equivalent ad valorem
Dolls and toys of cellulose compounds, having movable parts.....	\$140, 220	\$0.01 each +60%	113%
Dolls and toys of cellulose compounds, not having movable parts.....	19, 291	If each +50%	103%
Dolls and doll clothing, of lace.....	15, 787	90%	90%
Dolls and toys of china, air rifles, mechanical toys, toy books, toy games, toy musical instruments, rubber toys, etc.....	1, 094, 793	70%	70%
Model airplanes, metal figure, stuffed animals, building blocks.....	31, 822	45%	45%
Total or average.....	1, 301, 713	-----	75%

POST-WAR SHORT TERM

As a result of wartime restrictions on domestic production of these nonessential products, and because of the absence of imports from Japan and Germany during the war, there will be a considerable backlog of demand for dolls and toys when the war ends, particularly for the more durable and better grades supplied principally by the domestic industry. Consequently, there should be a considerably greater output than in 1939. It is likely, however, that imports in this period will be very much smaller than in normal pre-war years.

POST-WAR LONG TERM

Consumption, Production, and Imports

A 50-percent decrease or increase in duties probably would not materially affect the retail prices of the cheaper toys which constitute the bulk of imports. With duties 50 percent below those in 1939, however, the importers would make more profit and would, therefore, push sales of these articles by methods other than lowering of prices (for some articles prices would also be reduced). As a result, imports would probably be considerably larger than if the duty remained the same as in 1939. On the other hand, if duties were 50 percent above 1939 rates, it is likely that imports of the low-priced dolls and toys would be greatly restricted, with the result that total imports would be much smaller. The following estimates of imports are based on the assumption that Japan and Germany will have fully restored their toy-making industries by the long-term post-war period.

Per capita income at 1939 level.

The value of consumption might be about 54 million dollars, or about 10 percent greater than in 1939, because of the increase in population. Consumption would probably not change sufficiently with a 50-percent change in duties to warrant separate estimates.

Duty as in 1939.—It is probable that the imports would have a landed value slightly less than 5 million dollars (foreign value, about 3 million dollars) or somewhat above the pre-war average and much above the abnormally low figure of 1939. The value of production for the domestic market might then be about 49 million dollars.

Duty reduced by 50 percent.—The landed value of the imports would probably be in the neighborhood of 7½ million dollars (foreign value, about 5½ million dollars), or 50 percent more than with unchanged duties; and production for domestic consumption would have a value of about 46.5 million dollars.

Duty increased by 50 percent.—Such increase in duties would probably greatly reduce the imports of low-grade dolls and toys. The landed value of imports might be about 2 million dollars (foreign value, about 1 million dollars), while the output for domestic consumption would have a value in the neighborhood of 52 million dollars.

Per capita income 75 percent higher than in 1939.

The value of consumption under a larger income would probably be about 50 percent larger than with income at the 1939 level, or in the neighborhood of 81 million dollars. The consumption of dolls and toys (in quantity) does not expand proportionately with increases in the national income. Prices of these products would probably increase at about the same rate as the rise in the general price level under a higher income, say, 10-15 percent.

Duty as in 1939.—It is likely that the landed value of imports would be in the neighborhood of 7 million dollars (foreign value about 4 million dollars), and that the value of production for the domestic market would be about 74 million dollars.

Duty reduced by 50 percent.—The landed value of the imports might be about 11 million dollars (foreign value, about 7.5 million dollars), and domestic production would have a value of, say, 70 million dollars.

Duty increased by 50 percent.—It is probable that imports would have a landed value of slightly more than 5 million dollars (foreign value about 2.5 million dollars), while the value of domestic production might be expected to be in the neighborhood of 76 million dollars.

Exports

It seems likely that in the long-term post-war period our exports of the articles here considered will be 10-40 percent greater than in 1939, in terms of value, or, say, 4-5.5 million dollars, depending mainly on the level of world income.

Employment

The total number of workers in the domestic industry, which was about 17,400 in 1939, should be 19,000-22,000 in the post-war period, depending chiefly on whether the national income is substantially larger than it was before the war.

FIRECRACKERS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1515	Firecrackers:		
	Large (more than $\frac{3}{16}$ in. outside diameter or more than $1\frac{1}{4}$ in. in length):	25¢ per lb.	224.0%
	Small (all other)	8¢ per lb.	63.0%
	Average		64.2%

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export			
Quantity (1,000 pounds)	1,734	0	2,966	15,760	Percent
Value (\$1,000)	1,200	0	1,377		180
Unit value (per pound)	\$0.27		\$0.12		

1 Estimated.
2 Foreign value.

During 1934-38, imports of firecrackers averaged about 4.2 million pounds annually, with a foreign value of \$675,000 (averaging 15 cents a pound). Because of the Sino-Japanese war, which seriously interfered with shipments from China, imports in 1939 were considerably below the 1934-38 annual average, both in quantity and in value. Imports have normally constituted about 80 percent of domestic consumption of all firecrackers. The bulk of imports consisted of small firecrackers; only negligible quantities of the large variety, on which the duty is 3 times higher per pound, have been imported. Domestic production of firecrackers, on the other hand, consists almost entirely of salutes 2 inches or more in length.

Before 1939, the greater part of the world supply of firecrackers was produced in China; and that country, including Hong Kong, was the principal source of United States imports, usually accounting for about 98 percent of the total. The remainder was supplied principally by Japan, but after 1937 imports from this source declined sharply. Small quantities of firecrackers were also imported duty-free from the Philippine Islands. Imports of firecrackers since 1941 have been negligible.

POST-WAR SHORT TERM

Consumption may increase moderately over the 1934-38 level. Both imports and domestic production would probably increase and would supply about the same proportions of consumption as they did before the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

A 50-percent decrease or increase in the duty would probably have little effect, if any, on imports or consumption of small firecrackers, because the duty constitutes a very small proportion of the selling price per package, a large part of which represents dealers' margins. The duty on large firecrackers has greatly restricted imports in the past; but, even with a 50-percent reduction, the duty would still be more than 100 percent, too high to change the situation materially.

Per capita income at 1939 level.

Assuming about the same popularity of firecrackers as before the war, and no marked change in State laws or enforcement policies regarding their use, it might be expected that per capita consumption of firecrackers in the long term would be about the same as in 1934-38. Allowing for an increase in population, total consumption might amount to about 5.8 million pounds. If imports should supply about the same ratio of consumption as in the base period, they would amount to about 4.6 million pounds, with a foreign value of about \$690,000. Production would amount to about 1.2 million pounds, with a value of about \$325,000, at 1939 prices. These estimates would probably be about the same whether or not the duties were reduced or increased by 50 percent.

Per capita income 75 percent higher than in 1939.

It is probable that consumption of firecrackers under a higher national income might be as much as 25-30 percent larger than with no change in income, and might amount to approximately 7.5 million pounds. With higher world prices, high national income, and increased demand, prices of firecrackers would probably rise in about the same proportion as the general price level. Under the influence of increased purchasing power, domestic production might supply a greater proportion of total consumption than under a lower income, because domestic consumers would probably be inclined to buy proportionately more of the higher priced large domestic firecrackers. With no change in duty, imports might supply about 75 percent of consumption, and might be in the neighborhood of 5.0 million pounds, with a foreign value, at increased prices, of about \$950,000. Domestic production would then be about 1.9 million pounds, valued at about \$570,000 (say, 30 cents per pound). Changes in duty of 50 percent would probably not affect these estimates greatly.

Exports

Exports of firecrackers or salutes are not separately shown in United States statistics, but it is known that the quantity shipped abroad has been negligible in the past and will probably be negligible in the future.

MATCHES

Tariff paragraph: 1516.
 Commodity: Matches.
 Rates of duty: 17½¢ per gross boxes; 2¼¢ per thousand matches; 40% ad val. Equivalent ad valorem (1939): 80%

NOTE.—The duty imposed by the Tariff Act of 1930 on friction or lucifer matches was 20 cents per gross boxes containing not more than 100 matches each, and 234 cents per 1,000 matches if otherwise imported. The duty of 20 cents per gross boxes (frictioned strike-on-box safety matches in small boxes were imported under this rate) was reduced to 17½ cents, effective August 5, 1935, pursuant to trade agreement with Sweden. The 1930 Tariff Act rates of 40 percent ad valorem on wax, wind, book, and folder matches and on matches with colored stems was reduced, with respect to wax matches only, to 20 percent, effective January 30, 1945, pursuant to trade agreement with Mexico.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Total, all kinds						
Quantity (million matches).....	418,866	11	418,865	18,001	426,865	Percent 1.0
Value (\$1,000).....	25,538	44	25,492	1,295		
Unit value (per 1,000 matches).....	\$0.06			\$0.04		
Persons employed (number).....	5,420					
Strike-on-box matches only						
Quantity (million matches).....	33,961	11	33,950	8,000	41,950	19.1
Value (\$1,000).....	8,170	44	8,126	1,297		
Unit value (per 1,000 matches).....	\$0.09			\$0.04		

¹ Estimated.
² Foreign value.

Of the various kinds of matches produced in the United States in 1939, strike-anywhere matches, which are for general household use, accounted for about 56 percent of the total; book matches for smokers' use, for about 36 percent; and uncolored, strike-on-box safety matches, which are also for general use, for about 8 percent.

Imports of matches have usually been the strike-on-box variety, accounting in 1939 for about 98 percent of the total. Sweden has been the principal source, followed by the Soviet Union, Finland, and Japan. Imported strike-on-box matches always had uncolored stems until 1932, when Japanese producers began coloring the stems of the very cheap grades in order to bring them into the United States at the 40-percent ad valorem rate rather than at the rate of 20 cents per gross boxes. The 40-percent rate was equivalent to about 7 cents per gross boxes. In 1934 the United States excise tax on colored-stem matches was increased; the increase had the effect of an additional duty of about 16 cents per gross boxes. As a result, imports of colored-stem strike-on-box matches had become negligible by 1939. When colored-stem matches were imported, the ratio of total imports to total consumption of all matches amounted to about 5 percent; but, as imports of this kind of match declined, the ratio declined, amounting to slightly less than 2 percent in 1939.

Imports of strike-on-box matches with uncolored stems are directly competitive with domestic strike-on-box matches; the ratio of imports to consumption of this type of match was 19 percent in 1939.

The United States and Sweden each accounted for about 20 percent of the world output of matches in 1939; the Soviet Union accounted for about 17 percent. Other important producing countries were Japan, Great Britain, and Finland. The United States, the Soviet Union, and Great Britain produced largely for domestic consumption, whereas the other countries produced principally for export. Foreign-match production consisted almost entirely of the strike-on-box type of match, which is relatively unimportant in United States production and trade. Before the war the International Match Corporation, an affiliate of the Swedish Match Co., controlled the match trade in about 25 foreign countries (but not the Soviet Union or Japan), either by direct ownership and operation of factories or through financial control. In addition, the International Corporation had a financial interest in companies in other countries, including the United States, Great Britain, and France.

The outcome of an action recently instituted by the United States Department of Justice under the Sherman Antitrust Act against certain domestic and foreign match producers might affect the volume of United States imports of matches in the post-war period. The complaint charges that the largest domestic producer of the strike-on-box type has the exclusive agency for the importation of this type of match from Sweden, the principal foreign source, and that the effect of this agreement is to restrict and curtail United States imports and exports. However, since the strike-on-box type of match, the principal type imported, usually accounts for such a small part of total domestic consumption (about 8 percent), it is unlikely that the ratio of imports to over-all consumption of matches will be materially affected by the outcome of the case. Imports of strike-anywhere and book matches will probably continue to be small after the war, for the reasons that strike-anywhere matches have never been and probably will not be made on a large scale in the principal foreign producing countries, and that it is difficult for foreign producers to obtain contracts for the cover advertising of American products, which make up a large proportion of the book matches made in the United States.

POST-WAR SHORT TERM

Since March 1945, all the domestic strike-on-box matches and 35 percent of the domestic book matches have been taken for distribution to our armed forces. This has kept about one-third of the domestic output of all matches out of civilian consumption. It seems likely that these conditions will continue while the war lasts. Production and imports will probably be somewhat greater in the post-war short term than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

The estimates given below are based on the assumption that world production and trade in matches will be conducted generally along the lines prevailing in 1939, and that the status quo with respect to trade and production relations between large concerns in the principal

producing countries will continue in effect. If substantially different conditions should prevail as a result of the action by the Justice Department, imports of matches after the war might conceivably be substantially greater and domestic production somewhat less than indicated below.

In the estimates made under all the assumptions regarding national income and rates of duty, imports are compared with total domestic production of matches for the domestic market. As already pointed out, imports in the past have consisted almost entirely of strike-on-box matches and the same is likely to be true in the future under all the assumptions. The ratio of estimated imports of matches to the domestic production (for the domestic market) of strike-on-box matches would be very much higher, especially in terms of quantity, than the ratio to the total production for the domestic market. For example, in the estimate based on national income as in 1939 and a 50-percent reduction of duties, the imports are placed at 14 billion matches, or about 3 percent of the total production of all matches for the domestic market, amounting to about 456 billion. It is probable that under this assumption the consumption of strike-on-box matches would be approximately 37 billion, of which imports would supply about 14 billion, or 38 percent, and domestic production about 23 billion, or 62 percent. The effects of an increase or a decrease of 50 percent in the duties on the ratio of imports to consumption, when confined to strike-on-box matches alone, would be fairly conspicuous.

Per capita income at 1939 level.

The quantity of matches of all kinds used in this country should be about 10 percent above that in 1939, chiefly because of population gain; consumption should amount to about 470 billion matches.

Duty as in 1939.—The ratio of imports to consumption would probably remain at about 2 percent; therefore imports would be about 9 billion matches with a foreign value of about \$360,000, and domestic output retained for this market would amount to about 461 billion matches valued at 28 million dollars.

Duty reduced by 50 percent.—The ratio of imports would increase, probably amounting to as much as 3 percent of consumption. Imports would then amount to, say, 14 billion matches, with a foreign value of about \$560,000, and the output of the domestic industry retained for this market would probably be about 456 billion matches, valued at somewhat less than 27 million dollars.

Duty increased by 50 percent.—Imports would decline substantially, amounting probably to about 5 billion matches with a foreign value of about \$200,000. The domestic output retained for this market would amount to about 465 billion matches, valued at about 29 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption might be 10–15 percent greater than with income as in 1939. Accordingly, consumption might be in the neighborhood of 535 billion matches. Prices would probably increase in about the same proportion as the rise in the general price level under a higher income.

Duty as in 1939.—Imports might amount to about 11 billion matches with a foreign value, at increased prices, of about \$500,000; and the

domestic output retained for this market might amount to about 524 billion matches valued at slightly more than 34 million dollars.

Duty reduced by 50 percent.—It is likely that imports would supply about 3 percent of consumption or about 16 billion matches, with a foreign value, at increased prices, of about \$720,000. Domestic production retained for this market would then be about 519 billion matches, valued at slightly less than 34 million dollars.

Duty increased by 50 percent.—Imports would be curtailed substantially, probably to about 7 billion matches, with a foreign value, at increased prices, of about \$315,000, while domestic production retained for this market would probably be about 528 billions, valued at about 38 million dollars.

Exports

It is assumed that exports of matches in the post-war period will be about the same as in 1939. If the Justice Department's case should prove restraint of trade, it is conceivable that United States exports might be considerably greater. If, however, the status quo prevails in the post-war period, it is unlikely that exports would exceed \$50,000.

Exports will probably consist almost entirely of the strike-on-box type, as American strike-anywhere, and book matches in all likelihood will not be exported. The chief potential post-war export markets are Western Hemisphere countries, where strike-on-box matches of United States origin will likely be in but small demand, chiefly because of local production of that type.

Employment

The number of wage earners in the domestic match industry may increase to about 6,000 after the war.

CRUDE FEATHERS, EXCEPT OSTRICH

Tariff paragraph: 1518.

Commodity: Crude feathers, except ostrich.

Rate of duty: 20% ad val.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 lb.)	120,000	6,920	113,080	6,741	119,821	Percent
Value (\$1,000)	122,225	267		2,490		34
Unit value (per lb.)	\$0.11	\$0.048		\$0.37		

¹ Estimated.

² Production includes about 114 million pounds at 60 cents and 1894 million pounds at 8 cents. All of the former group, and a considerable part of the latter (i. e., the better grades), would be in the category mentioned below as feathers for beds.

³ Foreign value.

This statement covers all types of crude feathers except ostrich plumes. Feathers are used for a wide variety of purposes, but may be classified in two general categories: Small, fluffy feathers and down used in pillows, comforts, and sleeping bags, and known as feathers for beds; and large feathers used principally for decorative purposes in millinery and dress trimmings, but also for articles such as shuttlecocks, arrows, and artificial flies for fishing. By far the most important in quantity and value are feathers for beds; those best in quality come from waterfowl.

In 1939 and pre-war years, the annual production of waterfowl feathers in the United States amounted to more than 1 million pounds. The consumption of waterfowl feathers in 1939 amounted to about 8 million pounds, of which almost 7 million pounds were imported.

The potential quantity of chicken feathers available per year in the United States has been estimated at about 100 million pounds, but less than 20 million pounds have usually been marketed. United States exports of feathers are usually about equal to imports in weight, but exports consist of unsorted chicken feathers, valued at a little more than 4 cents a pound, whereas imports are almost entirely small duck and goose feathers and down, averaging about 37 cents a pound (foreign value).

China (including Hong Kong) has been by far the most important source of United States imports, although substantial quantities have come from Hungary and Poland.

Feathers other than those for beds consist of tail and wing feathers of pigeons, geese, turkeys, pheasants, and other fowl. The importation of the feathers of wild birds is prohibited, except small amounts used in the production of artificial flies for fishing. China and France have been the principal sources.

POST-WAR SHORT TERM

During the war all new waterfowl feathers suitable for pillows, sleeping bags, or aviators' uniforms have been allocated for military purposes. As a result, there will probably be a considerable postponed demand in the United States for bed feathers of the better type, and probably all the waterfowl feathers available from foreign countries will be imported. The amounts obtainable, however, are likely to be small. The principal supplying areas are likely to have only small stocks and very limited supplies of live waterfowl. Imports and, therefore, domestic consumption of waterfowl feathers will probably be below the 1939 level. Although domestic production may be expected to increase, it will still supply only a small part of the demand. Consumption of chicken feathers may be larger than in 1939 as a result of the shortage of imports of the preferred waterfowl feathers.

POST-WAR LONG TERM

Consumption, Production, and Imports

In view of the volume of the demand and the relation between imports and domestic production, and the moderate duty, it seems doubtful whether changes in the duties would much affect consumption, production, or imports, and no separate estimates are shown for the different duty assumptions.

Per capita income at 1939 level.

Per capita consumption of feathers is likely to be about the same as in 1939. Allowing for a 10-percent increase in population, consumption would then amount to about 22 million pounds, of which about 90 percent might be for beds and 10 percent for other purposes. It is probable that imports would supply most of the waterfowl feathers and practically none of the chicken feathers.

Assuming that China and other principal sources will be in a position to supply the United States, imports might amount to about 7½ million pounds (under each assumption as to duty). At a slightly higher unit value than in 1939 (because of a trend toward the importation of cleaner feathers), the foreign value of imports might be about 3 million dollars. Allowing for about the same volume of exports as imports, production would amount to about 22 million pounds valued at about 2½ million dollars, and exports would be valued at about \$325,000.

Per capita income 75 percent higher than in 1939.

The consumption of feathers might increase substantially. The use of lower quality chicken feathers would increase, perhaps by as much as 50 percent, but probably proportionately much less than the increase in the quantity of waterfowl feathers consumed, which might double. This increase would mean a total consumption of about 34 million pounds, about 55 percent greater than with income as in 1939. Domestic production might be more than 30 million pounds, valued at about 4 million dollars; of this amount, about 8 million pounds, valued at about \$400,000, might be exported. Production will probably continue to be largely chicken feathers. Prices can be expected to rise at about the same rate as the general price level under a higher national income.

Under these conditions, imports (under each of the assumptions as to duty) might amount to as much as 12 million pounds, if that much is available in foreign countries. At increased prices, the foreign value of imports might be as much as 6 million dollars.

Exports

Domestic exports have been and will probably continue to be entirely chicken feathers, many of which are of poor quality and not acceptable in the United States market. The domestic supply of chicken feathers is very large, and, if foreign markets could be found, probably more than 50 million pounds could be exported annually. With increases in population and some postponed demand in foreign countries, it is possible that exports will be larger after the war than in 1939.

Employment

There is no way of estimating the amount of labor involved in the domestic procurement of feathers. The bulk of the domestic supply comes from packing houses and farming areas, where the procurement of feathers is only incidental. A large proportion of the supply of waterfowl feathers is a byproduct of the duck-raising industries of Long Island and the Middle West.

ARTIFICIAL FLOWERS

<i>Tariff paragraph</i>	<i>Commodity</i>	<i>Rate of duty</i>
1518-----	Artificial or ornamental flowers, fruits, vegetables, etc.:	
	Of yarns, threads, filaments, etc-----	90%
	Of paper or other materials-----	60%

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000)-----	1 16,000	152	15,848	2 850	1 16,698	<i>Percent</i>
Persons employed (number)-----	1 4,800					5

¹ Estimated.

² Estimated landed value; foreign value is \$471,000.

The classes covered by this statement include a great variety of artificial flowers, fruits, vegetables, grasses, and the like, but both imports and domestic production consist predominantly of artificial flowers of various kinds. Artificial flowers may be grouped into two classes, namely, those for dress or millinery trimmings and those for decoration in homes, stores, and theaters. The former are made principally of fabrics and the latter are made chiefly of paper. A variety of other materials such as glass, leather, and plastics are used but none is particularly important. The dress and millinery type of artificial flowers are usually small and intricate in design and require a great amount of hand work. Imports consist predominantly of this class. On the other hand, decorative flowers of the larger varieties are the kinds usually made in the domestic industry. Germany, Japan, France, and Czechoslovakia were the principal pre-war sources of imports of both types.

The use of artificial flowers for dress and millinery trimmings is much more subject to changes in fashion than that of decorative flowers. The artificial-flower industry is one that could be quickly rehabilitated after the war.

POST-WAR SHORT TERM

In the immediate post-war years the consumption of artificial flowers will probably be considerably greater than in 1939, owing to assumed higher national income than in 1939 and to a backlog of demand for these products. Imports, which may consist in substantial part of small fabric flowers, will probably exceed the 1939 level by the end of the short-term period if the foreign industries are able to obtain adequate supplies of raw materials.

POST-WAR LONG TERM

Consumption, Production, and Imports

Prices and total consumption of artificial flowers would probably be little affected by 50-percent changes in tariff rates, although the rates are relatively high. Imports would probably continue to supply only a small part of total consumption and, to a considerable extent, would consist of small flowers and parts, not many of which are made in the United States. In the following forecasts, therefore, rounded consumption figures are indicated under each income level, and duty changes are reflected only in imports and production.

Per capita income at 1939 level.

Over a period of years, even though there may be fluctuations because of fashion trends, average per capita consumption of artificial flowers will probably be the same as in 1939. Allowing for an increase in population, the consumption of artificial flowers at this level of income might be in the neighborhood of 18 million dollars.

Duty as in 1939.—The foreign value of imports would probably be in the neighborhood of \$500,000 (landed value, \$900,000), and the value of domestic production would be about 17 million dollars.

Duty reduced by 50 percent.—Imports might increase substantially under a reduced duty. Imports might be as much as 8 percent of domestic consumption and amount to 1 million dollars (landed value, 1.4 million dollars) or more. If so, the value of domestic production would be about 16.5 million dollars, assuming that there will continue to be a small volume of exports.

Duty increased by 50 percent.—Imports would be curtailed slightly under an increased duty. The foreign value of imports would probably be about \$350,000 (landed value, \$750,000), and the value of domestic production would be about 17½ million dollars.

Per capita income 75 percent higher than in 1939.

A substantially higher national income could be expected to increase the consumption of artificial flowers by about 60 percent over 1939, including a rise in prices about equal to the rise in the general price level (10–15 percent) under a higher income. The value of consumption thus might increase to about 27 million dollars.

Duty as in 1939.—The foreign value of imports, at increased prices, might be somewhat less than 1 million dollars (landed value 1.8 million dollars) and the value of domestic production might be about 25 million dollars.

Duty reduced by 50 percent.—A substantial increase in imports would probably occur under a reduced duty. Imports might supply as much as 10 percent of consumption and might amount, in foreign value at increased prices, to about 1.8 million dollars (landed value 2½ million dollars), and the value of domestic production (including about \$250,000 worth of exports) would be in the neighborhood of 24½ million dollars.

Duty increased by 50 percent.—The foreign value of imports might be in the neighborhood of \$750,000 (landed value 1.6 million dollars) and the value of domestic production would be about 25½ million dollars, allowing for larger exports than in 1939.

Exports

Exports of artificial flowers are very small; Canada is the principal market. A substantial part of the shipments to that country before the war were types that filled immediate style demands which might have changed before orders could have been filled in other foreign countries. As indicated above, exports might range between \$100,000 and \$250,000, depending chiefly on the level of world income.

Employment

Employment in the artificial-flower industry fluctuates considerably from year to year and from season to season within each year. The industry has supplied considerable part-time employment for low-income groups in congested urban areas. Estimated employment in 1933, a low year, was about 2,300, whereas in 1939, a somewhat better-than-average year, it was about 5,500. In the long-term post-war period employment might be 5,500-8,000 persons, depending on the assumptions made as to national income and level of duties.

FURS (EXCEPT SILVER OR BLACK FOX), DRESSED OR DRESSED AND DYED

Tariff paragraph: 1519 (a) and 1519 (b).

Commodity: Furs (except silver or black fox), dressed or dressed and dyed, including fur plates, mats, linings, strips and crosses.

Rate of duty: 15%, 20%, 25%, 30%, 35%, and 40% ad val. *Equivalent ad valorem (1939):* 33%.

NOTE.—The rates fixed by the Tariff Act of 1930 were 25, 30, 35, or 40 percent ad valorem. Reductions in duty on most items were effected pursuant to the trade agreement with the United Kingdom, effective January 1, 1939. Subsequent reductions, not shown above, were made in the trade agreements with Argentina and Iceland.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	\$ 111,000	541	\$ 110,459	\$ 3,800	\$ 114,000	Percent ² 3
Persons employed (number).....	6,015					

¹ Based on the value of consumption of raw furs, to which has been added the estimated cost (20 million dollars) of dressing and dyeing both domestically produced and imported raw or undressed furs.

² Estimated.

³ Estimated landed value; foreign value was \$2,785,000.

Raw or undressed fur skins or pelts that have been cleaned, cut, and cured or otherwise prepared are known as dressed fur skins. All raw furs must be dressed, not only to prepare them for manufacture into fur goods, but in order to preserve them. Dyeing, an additional process to provide uniformity of color or, for inferior skins, to improve appearance, may or may not be applied to dressed skins.

Imports of dressed or of dressed and dyed furs have consisted largely of plates, mats, linings, strips, and crosses, which are made by sewing together whole furs or pieces of furs into approximately uniform sizes and shapes to facilitate handling and as a convenience in trading. Dressed or dressed and dyed furs are imported largely from China and from the Soviet Union, the United Kingdom, and Greece. Imports from China have consisted mostly of dog, goat, and kid plates, mats, and so forth; those from the Soviet Union and the United Kingdom, of squirrel and Persian lamb plates; and those from Greece, of a wide variety of plates made from small pieces of fur exported for that purpose from the United States.

Fur plates, mats, and so forth, of the types which are imported are not produced in the United States. Imports of dressed or dressed and dyed furs other than in the form of plates, mats, linings, and so forth, have been small and are likely to continue to be small, for the reason that United States manufacturers of fur goods prefer to purchase abroad raw or undressed fur skins and have them processed in this country where the fur-goods manufacturer can exercise general supervision of the work and take advantage of changing fashions. Moreover, the cost of dressing and dyeing represents a comparatively small part of the total cost of the dressed and dyed fur.

Fur plates, mats, linings, and so forth, are imported into the United States to supply a special and somewhat limited demand for low-priced furs to be used as fur linings and in making low-priced fur coats. Imports of these furs would probably increase to some extent under a high national income but they are not likely to increase nearly as much, percentagewise, as imports of raw furs. The limited market in the United States for plates, mats, linings, and so forth, and the fact that they represent a relatively small part of the cost of the finished garment into which they are made, indicates that a 50-percent increase or decrease in the duties on these products would have comparatively little effect upon the quantities imported.

POST-WAR SHORT TERM

Consumption and production of dressed or dyed furs might be a great deal larger than in 1939 if purchasing power in the United States remains high. Imports of dressed or dyed furs will probably be about the same as in 1939 in contrast with imports of raw furs, which will probably be much larger than in that year.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Allowing for the fact that consumption of furs in 1939 was somewhat smaller than in 1936-38 and for an increase of 10 percent in population, consumption of dressed or dressed and dyed furs might be about 35 to 40 percent more than in 1939, or about 155 million dollars. Production for the domestic market then would probably amount to about 150 million dollars. Imports might increase somewhat over the 1939 level and amount to about 5 million dollars landed value (about 3½ million dollars foreign value). Thus, imports would supply about 3 percent of domestic consumption; changes in duty would affect imports only slightly, and domestic production probably not at all.

Per capita income 75 percent higher than in 1939.

Because furs are luxury articles, the demand for them follows closely the level of national income. A high income level would cause a substantial increase in the volume of consumption of furs and a much greater increase in fur prices than would be true of prices of commodities in general. The volume of consumption and production of dressed and dyed furs might be about 30 percent more than at the lower income level and fur prices might increase by as much as 70 percent. The value of consumption then might be in the neighborhood of 340 million dollars and the value of production for the domestic market about 333 million dollars. Imports might supply about 2 percent of consumption, amounting to about 7 million dollars landed value (more than 5 million dollars, foreign value).

Exports

Exports of dressed or dressed and dyed furs have been small and will probably continue to be small in the post-war period.

Employment

The number of persons employed in dressing and dyeing furs after the war might amount to 7,000 with a per capita income about equal to that in 1939, and to about 10,000 with an income level 75 percent higher.

SILVER OR BLACK FOX FURS

Tariff paragraph: 1519(c).

Commodity: Silver or black fox furs or skins, dressed or undressed, n. s. p. f.

Rate of duty: 37½% ad val.

NOTE.—The rate fixed in the Tariff Act of 1930 was 50 percent ad valorem, which was reduced to 37½ percent, effective January 1, 1939, pursuant to the trade agreement with Canada. A further reduction to 35 percent was made January 1, 1940, pursuant to supplementary agreement, subject, however, to an absolute quota of 100,000 for silver or black foxes, furs, parts, and articles, combined, for each 12-month period beginning December 1. The quota was revised, effective December 20, 1940, excluding parts of furs, piece plates, and fur articles from the 100,000 quota and providing separate quotas therefor. No more than 25 percent of the quota on foxes and furs may be entered in a single month, and 70 percent of the quota is allocated to Canada, the remainder to other countries, the allocations becoming ineffective after May 1 of each quota period. Imports of foxes are negligible.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports ¹	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pieces).....	350	5	345	133	478	Percent 28
Value (\$1,000).....	\$10,500	86	\$10,414	\$2,468		
Unit value (per piece).....	\$30.00	\$16.45	\$30.00	\$18.52		
Persons employed (number).....	5,000					

¹ Imports in 1939 were far above the 1936-38 average of 9,000 skins, and 33 percent above the present annual quota of 100,000 skins.

² Estimated.

³ Foreign value.

Silver or black fox is a color phase of the common red fox. This color phase is rare in nature, but it has been produced successfully on fur farms through selective breeding.

The raising of silver or black foxes on farms and ranches is an important industry in the United States, engaging the full time of approximately 4,000 persons and representing an investment of about 50 million dollars. In addition to those who devote all their time to raising foxes, a large number devote part of their time to fox farming.

Silver fox furs formerly were used only for scarfs or neckpieces, but now, owing to the greatly increased number of skins available, they are also used quite extensively as trimmings (collars and cuffs) for fur or cloth coats and in making fur capes, wraps, and coats.

World production of these furs increased rapidly after 1930, the greatest expansion taking place between 1935 and 1939. In the latter year, world production was estimated to be between 1 and 1½ million skins. Of this total, Norway produced about 400,000, the United States about 350,000, and Canada about 300,000. Small quantities were produced in a number of other countries, chiefly Sweden, Finland, and the Soviet Union. Reports indicate that the silver fox breeding stock in Norway has been largely depleted during the war, though some of it might have been removed to Sweden. Since 1939, production in Canada has declined by about 25 percent, while annual production in the United States has increased to approximately 400,000 skins. Thus, world production of silver or black fox furs at the present time probably amounts to not more than 750,000 skins a year. After the end of the war the industry may be gradually re-established in Norway and also may be expanded in other European countries. These developments will probably be slow, and it is doubtful whether pre-war levels of production in Europe can be reached in the immediate post-war period. Production in Canada and in the United States might increase during this period but not sufficiently to cause world production to be as large as before the war. In the later post-war period, world production might be substantially above the 1939 level. Unlike other furs, practically all of which are obtained by trapping wild animals, production of silver fox furs might be limited by costs of production on fur farms. In order to expand the market to a point where greatly increased numbers might be sold, the price would have to be lowered enough to enable persons of relatively small income to purchase them, and it is uncertain whether these furs could be produced profitably.

The principal sources of United States imports in pre-war years were Canada and Norway; by 1939, small but increasing quantities were being imported from Sweden, Finland, and the Soviet Union. Practically all the silver or black fox furs imported into the United States are raw or undressed. These are the only raw or undressed furs which were subject to duty under the Tariff Acts of 1930 and 1922.

Since silver or black fox furs, among the higher-priced furs, are considered to be luxuries, the volume of consumption would be much affected by the trend of national income if the world supply could be expanded or contracted readily. Actually, however, in times of prosperity world production would probably increase to a much less extent than national income because the nature of the industry precludes rapid expansion; and, during depression periods, production would probably decline less markedly than national income since

breeding stock must be retained in sufficient numbers to enable the fur farmer to stay in business. By reason of this factor, prices fluctuate to a much greater extent than the general level of prices of all commodities.

POST-WAR SHORT TERM

Assuming that the quota provisions for imports will remain in effect, consumption would probably be slightly larger than in 1939. Domestic production might increase substantially, more than offsetting the 25-percent decline in imports which the quota limit would cause. If the quota provisions should be removed, consumption might be slightly greater than if they remain in effect. Imports, however, would probably be no greater than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

With the quota in effect, consumption might be about 700,000 skins. Being a relatively new and expanding industry, domestic production might rise to about 600,000 skins, with a value, at prices somewhat less than in 1939, of about 16 million dollars. Imports, being limited by the quota, would amount to 100,000 skins, with a foreign value somewhat less than 2 million dollars. A 50-percent change in the rate of duty probably would have no effect on consumption, production, or imports, because the quota would be the limiting factor on imports.

If the quota should be removed, the situation might be quite different. Increased world production might cause a large increase in United States imports even with no reduction in duty, and might force prices to a point substantially below the level of 1939. Since costs of production in this country are probably higher than in other important producing countries, and since feed prices and other costs may be at 1939 levels while prices of silver fox furs might be below those in 1939, domestic production might decline sharply, varying with changes in duty. The following estimates under the various rates of duty are made under the assumption that the quota will *not* be in effect. In these estimates, as in those relating to the higher income level, it is assumed that a reduction of duty would result in somewhat lower prices for domestic furs and somewhat higher foreign prices for imported furs, but that part of the effect would be to increase the share of imports in consumption. It is assumed that a higher duty would have converse effects.

Duty as in 1939.—Consumption might amount to about 700,000 skins. Of this total, domestic production might amount to 300,000 skins, valued at 8 million dollars; and imports might amount to 400,000 skins, with a foreign value of about 6½ million dollars.

Duty reduced by 50 percent.—Because of lower prices resulting from reduction of the duty, consumption might amount to about 800,000 skins. Domestic production might decrease to 200,000 skins valued at 5 million dollars. Imports might increase to about 600,000 skins, with a foreign value of 10 million dollars.

Duty increased by 50 percent.—Consumption might amount to about 600,000 skins. Domestic production would probably be about 400,000

skins valued at, perhaps, 11½ million dollars. Imports might possibly decline to 200,000 skins, with a foreign value of about 3 million dollars.

Per capita income 75 percent higher than in 1939.

With increased income and larger domestic production resulting from prices possibly 70 percent higher than in 1939, consumption might amount to as much as 900,000 skins, if the quota remains in effect. Of this total, domestic production might account for 800,000 skins valued at 40 million dollars; and imports, limited by the quota, would amount to 100,000 skins, with a foreign value of about 3 million dollars. Changes in rates of duty would probably have no effect on imports if the quota remained the same as in 1939.

The following estimates, under the various duty assumptions, would apply only if the quota should be removed. In that event domestic production would probably supply a much smaller proportion of the consumption than with the quota in effect.

Duty as in 1939.—Consumption might amount to about 900,000 skins. Domestic production might be about 400,000 skins valued at about 20 million dollars, and imports might be about 500,000 skins, with a foreign value of perhaps 15 million dollars.

Duty reduced by 50 percent.—Consumption might amount to about 1 million skins. Domestic production might be about 300,000 skins, valued at about 14 million dollars. Imports might amount to about 700,000 skins, with a foreign value of perhaps 23 million dollars.

Duty increased by 50 percent.—Consumption might amount to about 800,000 skins, domestic production to 500,000 skins valued at 26½ million dollars, and imports to 300,000 skins with a foreign value of about 8 million dollars.

Exports

Exports of silver or black fox furs have been negligible and would probably not increase materially in the post-war period.

Employment

The number of persons employed in producing silver fox furs would probably vary with production, possibly ranging from 3,000 if production should be as low as 200,000 skins, to 10,000 if production should rise to 800,000 skins.

HUMAN HAIR AND MANUFACTURES

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1523	Human hair and manufactures:		} 21%.
	Raw hair.....	10% ad val.....	
	Drawn hair.....	20% ad val.....	
	Nets and nettings.....	35% ad val.....	
	Tops, rovings, and yarns.....	3¢ per lb. + 12½% ad val.	
	Press cloth.....	4¢ per lb. + 30% ad val.	
	Manufactures, not specifically provided for.	35% ad val.....	

NOTE.—The rates shown above are those fixed in the Tariff Act of 1930 except in the case of tops, and so forth, and press cloth, which were dutiable under the Tariff Act at 6 cents per pound plus 25 percent, and at 8 cents per pound plus 40 percent, respectively. The reduced rates for these items shown above were made effective January 1, 1930, pursuant to the trade agreement with the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000)	2,384	208	2,178	11,066	13,245	Percent 83
Persons employed (number)	1,425					

¹ Estimated landed value; foreign value was \$858,000.
² Estimated.

This statement covers human hair in an unmanufactured as well as manufactured condition. United States production consists almost equally of press cloth and such related articles as switches, wigs, and transformations, made from imported hair. On the other hand, imports consist almost equally of raw human hair, about 90 percent of which is Asiatic and 10 percent European, and hair nets, wigs, transformations, and toupees made from human hair. Press cloth made from human hair (almost entirely from Asiatic human hair) is used in hydraulic presses in extracting vegetable oils. European human hair is used exclusively in making wigs and transformations.

China is the principal source of raw or drawn Asiatic human hair, with small quantities coming also from Japan. Germany and Italy are the principal sources of raw and drawn European human hair, and France is the principal source of imports of products manufactured from human hair. An indication of the importance of the various classes of imports covered by this statement is given in the following tabulation of imports for 1939. There were no imports of press cloth or tops, roving, and yarns in 1939.

Articles	Foreign value	Rate of duty Percent
Asiatic raw human hair	\$441,268	10
Other raw human hair	81,186	10
Drawn Asiatic hair	9	20
Other drawn hair	681	20
Hair nets and netting	301,374	35
Other manufactures of hair	79,020	35
Total or average	853,488	21

POST-WAR SHORT TERM

Consumption of human hair and human-hair manufactures will probably be larger than in 1939. Production and imports will also probably be higher, each supplying about the same proportion of consumption as in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Consumption of these products has been trending downward in recent years. This trend is not likely to be interrupted by tariff changes. Nor is the level of consumption at any given time likely to be materially affected by changes of 50 percent in the duty in either direction, as the demand for these products is more or less inelastic. Such changes would not be likely to affect appreciably the ratio of imports to production, since that part of the imports consisting of raw material for domestic manufacture is subject to relatively low duties, while the remaining imports, consisting of manufactures, comprise principally hair nets, of which there is no domestic production.

Per capita income at 1939 level.

Total consumption will probably be about 15 percent below 1939, or about 2.7 million dollars. This total is based on two assumptions: (1) That less cottonseed will be expressed than in 1939 and that a somewhat greater use will be made of other means of expressing vegetable oils; and (2) that per capita consumption of hair nets and related articles will remain more or less constant or decline gradually. Under these assumptions the landed value of imports might be in the neighborhood of \$900,000 (about \$725,000, foreign value, with duties at the 1939 level). The value of production for the domestic market might amount to about 1.8 million dollars. These figures would change but little with 50-percent changes in the duties in either direction.

Per capita income 75 percent higher than in 1939.

The volume of consumption of human hair and human-hair manufactures would probably be about 10 percent higher than with income at the 1939 level, and prices would probably rise about 10 percent above the 1939 prices. The value of consumption, then, might amount to about 3.2 million dollars; if so (under either of the duty assumptions), the landed value of imports would probably amount to about 1 million dollars (about \$800,000, foreign value, with duties at the 1939 level), and production for the domestic market would probably amount to about 2.2 million dollars.

Exports

Exports have been small and will probably continue to be small under both of the above assumptions of national income.

Employment

The number of persons employed in the manufacture of articles of human hair in the post-war period will probably vary but little from the number employed in 1939.

JEWELRY

Tarif paragraphs	Commodity	Rate of duty	Equivalent ad valorem (1939)
1503, 1527, and 1528.	{ Jewelry and related articles { Imitation pearls	See note do	} 67%.

NOTE.—The duties fixed in the Tariff Act of 1930 on articles covered by this report, reduced to ad valorem equivalents, ranged from 20 to 110 percent; jewelry and related articles, 60 to 110 percent; imitation pearls, 20 to 110 percent. Under the trade agreement with France, effective June 16, 1939, rates of duty were reduced on gold or platinum jewelry and related articles from 80 percent to 60 percent, and on jewelry and related articles of other materials, valued at more than \$5 per dozen pieces, from 110 percent to 60 percent. The rate on all jewelry originally subject to the 110-percent rate, including jewelry of such character covered by the French agreement, was reduced to 55 percent ad valorem pursuant to the agreement with Mexico, effective January 30, 1943, subject to the right of withdrawal or modification of the reductions in the Mexican agreement after termination of the emergency. The rate on certain items valued at not more than \$5 per dozen pieces, originally 110 percent, was reduced to 55 percent pursuant to the Czechoslovak agreement, effective from April 16, 1938, until suspension of the agreement on April 22, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000)	105,269	3,091	102,178	1,812	105,990	Percent 1.0
Persons employed (number)	25,000					

¹ Estimated landed value; foreign value was \$1,066,000.
² Estimated.

NOTE.—Data for production, exports, and imports are not strictly comparable.

The items under discussion include jewelry for personal adornment, such as rings, necklaces, bracelets, brooches, and earrings; related articles to be worn on or carried about the person, such as buckles, cuff buttons, cigarette cases, compacts, and so forth; and imitation pearls. Imitation pearls accounted for a small percentage of imports shown in the foregoing table.

In general, jewelry manufacturers may be divided into two major groups, designated by the trade as the precious-metal group, and the medium- and low-priced jewelry group. Domestic production has supplied by far the greater part of the domestic market, and since 1934 exports have exceeded imports. The greater part of the jewelry imported has been of materials other than gold or platinum.

In 1929 imports of jewelry and related articles amounted to 5.2 million dollars and consumption to 210 million dollars. Imports declined to 1.1 million dollars in 1931, and to an annual average of 0.3 million dollars during 1933-35.

Before the war in Europe, Czechoslovakia was by far the most important source of imports of jewelry not of gold or platinum; other important sources were France, Denmark, the United Kingdom, China, and Japan. Beginning in 1942, Mexico became the principal supplier. Japan was the principal source of imports of imitation pearls before the war, followed by Spain and France.

POST-WAR SHORT TERM

Consumption of jewelry will probably be considerably above the 1939 level because of shortages in certain types of jewelry during the war, and because of accumulated purchasing power. If the rates of duty to which imports of jewelry were subject in 1943 remain in effect, imports might be expected to be substantially greater than those in 1939, assuming that ample supplies are available.

POST-WAR LONG TERM**Consumption, Production, and Imports**

In making the following estimates, it is assumed that, as in the past, consumption of jewelry in periods of increasing economic activity might rise at a more rapid rate than national income and decline at a more rapid rate in periods of receding economic activity. It is also assumed that a larger proportion of the total purchases of jewelry will consist of more expensive types when national income is high than when it is low; and that a certain amount of jewelry will be imported as samples regardless of how high the rates of duty might be.

The rate of duty on jewelry and related articles was increased from 60 percent under the act of 1913 to 80 percent under the act of 1922, and further increased to 110 percent under the act of 1930. A 50-percent reduction in the rates in effect in 1939 would result in ad valorem rates of 30 percent, 32½ percent, and 55 percent, respectively.

Per capita income at 1939 level.

Duty as in 1939.—Consumption might amount to 116 million dollars. Because imports from Czechoslovakia in 1939 were abnormally low, and Mexico was not an important supplier in that year, but has since become important, imports would probably supply a substantially larger share of consumption than in 1939, probably about 4 percent. The landed value of imports might be about 5 million dollars (3 million dollars foreign value). Production for the domestic market would then have a value of 111 million dollars (excluding 4 million dollars for export).

Duty reduced by 50 percent.—Consumption might increase to about 128 million dollars. Imports would probably be 5 times as much as with the duty unchanged and have a landed value of about 25 million dollars (18 million dollars, foreign value). Production for the domestic market (excluding 4 million dollars for export) would then have a value of about 103 million dollars. It is possible that imports would increase considerably more than fivefold.

Duty increased by 50 percent.—Consumption might be valued at about 115 million dollars. Imports might be one-fifth less than with the duty unchanged and have a landed value of about 4 million dollars (2 million dollars foreign value). Production for the domestic market (excluding 4 million dollars for export) would have a value of perhaps 111 million dollars.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Consumption might be about 80 percent more than with income as in 1939 and amount to about 205 million dollars. The share supplied by imports would probably be slightly large than under the lower income level. The landed value of imports would then be about 10 million dollars (6 million dollars, foreign

value). Production for the domestic market (excluding 6 million dollars for export) would then have a value of 195 million dollars. Part of the increase in production and imports would result from higher prices.

Duty reduced by 50 percent.—Consumption might increase to about 235 million dollars. Imports might have a landed value of 50 million dollars (37 million dollars, foreign value), and production for the domestic market (excluding 6 million dollars for export) would then be valued at 185 million dollars.

Duty increased by 50 percent.—Consumption might amount to 203 million dollars. Imports might have a landed value of about 6 million dollars (3 million dollars, foreign value). Production for the domestic market (excluding 6 million dollars for export) would then be valued at 197 million dollars.

Exports

Exports of jewelry and related articles increased steadily from 0.6 million dollars in 1934 to 3.1 million dollars in 1939, and to a still higher level during the war. Until the end of 1941 Canada was the principal market; during the war Latin America has taken by far the greater part of United States exports.

In the post-war long-term period exports might amount to about 4 million dollars if world income is at the 1939 level, and to about 6 million dollars if world income is substantially higher.

Employment

The jewelry industry is centered in New England and New York. If rates of duty applicable to imports of jewelry in 1939 were in effect, the number of persons employed in the industry in the long-term period might amount to about 26,000 with income at the 1939 level, and to about 50,000 with income and tariffs at the maximum levels previously specified.

GEMS

<i>Tariff paragraph</i>	<i>Commodity</i>	<i>Rate of duty</i>
1528.....	Pearls; diamonds and other gem stones, cut but unset.	10% ad val.
1068.....	Diamonds and other gem stones, rough or uncut.	Free.

NOTE.—The rate on turquoise, cut but not set, was reduced from 10 percent ad valorem to 5 percent ad valorem, effective June 28, 1944, pursuant to trade agreement with Iran.

GENERAL

United States production and imports in terms of value (\$1,000), for 1939 were as follows:

Item	Production		Imports
	Total	For export	
Pearls, and diamonds and other gem stones, cut but not set.....	(1)	164	30, 298
Diamonds and other gem stones, rough or uncut.....	235	(1)	8, 086
Total.....	235	164	38, 378

1 Not available.
 2 Classified as precious, synthetic, and imitation stones.
 3 Estimated.

NOTE.—Production, export, and import data not strictly comparable.

This comment covers pearls, and diamonds and other gem stones, rough or uncut and cut but not set, used for jewelry. It does not include industrial diamonds, synthetic stones, imitation stones, or imitation pearls.

A large part of the United States consumption of cut diamonds and other gems and the total consumption of rough diamonds are supplied by imports. Of total United States imports of gems in 1939, cut diamonds accounted for more than 70 percent, and rough or uncut diamonds for more than 20 percent (in value).

More than 95 percent of the world's supply of rough diamonds is produced in Africa. There is a small production in Brazil and Venezuela. Development of the Venezuelan deposits may have considerable possibilities. Production and sale of virtually all the African diamonds are under the strict control of a cartel. Sales of these stones to dealers and cutters are made through the cartel's offices in London and Kimberley. Before the war there were important secondary markets in Antwerp and Amsterdam—the principal cutting centers in Europe—where many of the rough diamonds were resold. Most of the rough or uncut gem diamonds reaching the United States came through Belgium, the Netherlands, and the United Kingdom.

During the war the cutting industry in the United States has expanded considerably. Palestine, the Union of South Africa, Brazil, the United Kingdom, and Cuba have become the principal sources of imports of cut diamonds.

France, British India, the United Kingdom, Germany, Brazil, Thailand, and Ceylon have been important suppliers of cut gem stones other than diamonds. Natural pearls have been imported principally from France, British India, and the United Kingdom; these sources largely market pearls produced elsewhere. Virtually all cultured or cultivated pearls have come from Japan.

Over a long series of years, imports of gems have shown a downward trend, although they have also tended to increase in periods of prosperity and to decrease in periods of depression. Generally speaking, rates of duty seem to have little effect on the importation of gems, although high duties have encouraged smuggling. In 1919, imports amounted to 100.6 million dollars, in 1929 to 70.8 million dollars, and in 1939 to only 38.4 million dollars, although population was much larger and rates of duty were substantially lower in the latter year than in the earlier years named. The actual decrease in the volume of stones brought into this country, however, is probably understated by these figures since sizable quantities of cut diamonds are said to have been smuggled when the rates of duty were 10 and 20 percent on the rough and cut stones, respectively.

Any consideration of the post-war demand for, and the supply of, gem diamonds should properly take into account (1) that diamonds are indestructible, or nearly so, and virtually all of the stones that have been imported through the years are presumably still in the country, and serve to meet a considerable part of consumer demand, being acquired by inheritance, by purchase, or as gifts; (2) that supplies are accumulated by the syndicate and released from stock

only in such quantities as will bring the most profitable prices; and (3) that although gem diamonds for the most part are used for purposes of ornamentation, they are sometimes purchased for investment and as a hedge against inflation.

POST-WAR SHORT TERM

In the first few years after the war a great many durable consumers' goods not available at present will again be on the market and will compete with jewels for the consumers' dollars. It seems probable that this competition and the 20-percent internal revenue tax on jewelry (no tax in 1939), if it remains in effect, may offset to some extent accumulated demand. Even though purchases by the public may be only slightly greater than in 1939, inventories of dealers have been so depleted during the war that it is probable that the value of gem imports will be considerably above the 1939 level.

A large part of the diamond-cutting business, particularly the cutting of small stones, will doubtless revert to Belgium and the Netherlands. The United States, however, will probably continue to cut a substantial part of the larger and higher quality diamonds.

POST-WAR LONG TERM

The contingencies that govern the supply and price of diamonds are so numerous and diverse that future developments in the industry cannot be forecast with any degree of accuracy. The estimates of imports in the long term, therefore, are based on postulated conditions approximating those that have obtained in the past.

It is assumed that the bulk of the imports of gems will consist of diamonds, that the relative demand for the various gems will be about the same as in 1939 (i. e., that no change in fashions will occur), that most of the diamonds will be imported in cut form, and that 50-percent changes in the present 10-percent duty on cut stones would have but slight effect on imports. A decrease in the duty might be partly or wholly absorbed by foreign cutters or dealers, and an increase might tend to encourage smuggling.

Per capita income at 1939 level.

The foreign value of total imports of gems might amount to about 40 million dollars, regardless of changes in the duty. This figure would exceed the 1939 figure by only about 5 percent, or by less than the increase in population, it being assumed that there would continue to be a downward trend in the per capita demand, though not so marked as in the two decades preceding the war.

Per capita income 75 percent higher than in 1939.

The foreign value of total imports of gems might amount to between 60-70 million dollars, regardless of changes in duty. This estimate assumes that so great an increase in income would cause purchases of this luxury item to be 50-75 percent larger than with income as in 1939. Of course if style should be much less favorable to gems than before the war this estimate might be too high.

IMITATION AND SYNTHETIC GEM STONES

Tariff paragraph	Commodity	Rate of duty
1528	Imitation gem stones:	
	Imitation precious stones:	
	Not cut or faceted	60% ad val.
	Cut or faceted	20% ad val.
	Imitation semiprecious stones:	
	Not faceted	60%
	Faceted	20%
	Synthetic gem stones	20%

NOTE.—The above rates are those specified in the Tariff Act of 1930. The 60-percent rate was reduced to 30 percent and the 20 percent rate to 10 percent, from April 16, 1938, to April 21, 1939, pursuant to the trade agreement with Czechoslovakia, but this agreement was suspended April 22, 1939. Synthetic stones are not enumerated separately in the tariff act; cut synthetic gem stones are held dutiable at rates specified for certain imitation precious and semiprecious stones; the raw material is held dutiable as a mineral substance or material not elsewhere specified (30 percent, par. 214).

GENERAL

No data on United States production are available for 1939, but production is known to have been small. Exports were negligible. Imports were as follows:

Class	Value (1,000 dollars)
Synthetic gem stones, cut or faceted	1 103
Imitation gem stones, cut or faceted	1, 930
Total	2, 033

¹ Foreign value.

Paragraph 1528 provides for imitation precious or semiprecious stones but does not provide for synthetic stones; the latter, which are not specifically provided for anywhere in the tariff act, are, however, held dutiable as imitation precious or semiprecious stones under paragraph 1528 at 20 percent ad valorem.

Imitation and synthetic stones differ in composition and production and in other important respects, yet they are competitive in the manufacture of medium-priced jewelry, which, from the point of view of quantity as well as of value, is very important in the jewelry field. These two kinds of gem stones are, however, dissimilar enough to warrant separate treatment in this discussion.

IMITATION GEM STONES

Imitation gem stones are manufactured principally from special types of glass, although plastics also are used. They serve mainly in the manufacture of low- and medium-priced jewelry and related articles, and for the ornamentation of wearing apparel.

A large part of the imitation stones imported into this country consists of rhinestones, which are not produced in the United States. More than 90 percent of the imports in 1939 were dutiable at the 20-percent rate. Other imitation gem stones were manufactured in the United States on a fairly large scale for the first time during the present war. The foreign-made stones are superior in quality and are produced at a fraction of the cost of production in this country.

During 1928-39, United States imports of imitation gem stones ranged from a value of 4 million dollars in 1928 to a low of less than 1 million dollars in 1933. In 1939 the foreign value of imports was almost 2 million dollars. Imports during the war have declined to only about 5 percent of the pre-war figure. Czechoslovakia has long been the foremost producing country and, before the war in Europe, was the chief supplier of United States imports; Austria, Germany, and France were lesser sources of supply.

Post-War Short Term

Domestic production during the war has failed by a wide margin to meet the deficit in supplies caused by the decline in imports, and dealers' stocks are rapidly being exhausted. The manufacture of imitation gem stones in Czechoslovakia, the principal pre-war supplier, is largely a home industry, and if that country is able at the end of the war quickly to resume exports to the United States, imports doubtless will be considerably above the 1939 level.

Post-War Long Term

Since pre-war statistics of domestic production or consumption are not available, it would be difficult to furnish post-war estimates for these items. It is known, however, that pre-war consumption was supplied largely by imports. In view of the superior quality of foreign-made imitation stones and the low costs of production abroad, it is probable that the greater part of United States requirements will continue to be imported after the war. It is doubtful if even a 50-percent increase in the duties would permit the maintenance after the war of more than a very small domestic industry, if any.

Changes in the tariff rates on jewelry would affect the consumption and importation of imitation gem stones indirectly. The demand for imitation gem stones by the domestic jewelry industry, rather than the tariff rates on the stones, largely determines the importation of these stones. If a lower tariff should cause a decline in domestic jewelry production, a simultaneous decline in the tariff on stones would have little effect in preventing a decline in the imports of these stones. If a higher tariff stimulated the domestic jewelry industry, the higher prices of the imported stones would not stand in the way of their importation.

The following estimates of imports of imitation gem stones are based largely on the production level of the jewelry industry as set forth in the discussion on jewelry.

Per capita income at 1939 level.

The foreign value of imports of imitation gem stones might amount to about 2½ million dollars if duties (on the stones and on jewelry) are the same as in 1939 or are increased by 50 percent (slightly less under the former assumption than under the latter), and to about 1½ million dollars if the duties in effect in 1939 are reduced by 50 percent.

Per capita income 78 percent higher than in 1939.

The foreign value of imports might be in the neighborhood of 4 million dollars if the duties are the same as in 1939, or increased by 50 percent (slightly less under the former assumption than under the latter), and to about 3½ million dollars if the duties in effect in 1939 are reduced by 50 percent.

SYNTHETIC GEM STONES

Synthetic gem stones are composed of the same elements as the natural gem stones they simulate. They have the same chemical, physical, and optical properties as the natural stones.

Synthetic gem-stone materials are widely used in the manufacture of synthetic gem stones for medium-priced jewelry. Synthetic corundum (sapphire and ruby) is also being utilized on an increasing scale for industrial, military, and other purposes. Among the most important of these are jewel bearings for watches, precision instruments, and scientific apparatus; thread guides; electrical insulators; and tips for gauges.

Before 1941, virtually all United States requirements of synthetic stones were met by imports from Europe in the form of jewel bearings and, to a lesser extent, of the stones themselves. Statistics are not available to show the total imports in all forms, but imports of cut synthetic gem stones in 1937 were valued at \$216,700. Germany was the principal supplier.

With the outbreak of the war and the great need for jewel bearings to supply military and industrial requirements, it became necessary to develop the domestic production of synthetic corundum and of jewel bearings. Producers in the United States are now capable of meeting total domestic requirements for synthetic corundum. Even in the brief time that synthetic corundum has been produced in this country, significant technological improvements have been developed in its production. Although, during the war, production has gone into industrial uses (for jewel bearings), there has also been development of technology for the cutting of gem stones, both natural and synthetic. In short, an industry has been developed which, although established for the purpose of supplying a strategic product in war-time (jewel bearings), is adapted also to the production of synthetic gem stones. There is little doubt that synthetic stones, whether domestic or imported, will find a constantly expanding market for both industrial and ornamental purposes, with industrial applications absorbing by far the greater part of the volume.

Post-War Short Term

It seems likely that rough synthetic stones for industrial purposes (jewel bearings) will be obtained largely from domestic producers since supplies will presumably be available from domestic sources and may for some time be difficult to obtain from abroad.

Cut synthetic gem stones have not been produced in this country during the war, and it is doubtful whether imports have been adequate to meet current demand. When wartime restrictions on the jewelry

industry are lifted, a boom in the production of jewelry is expected, and the industry will doubtless require substantial quantities of synthetic stones. Within the limits of available supply (considering possible interruptions thereto by reason of reconversion here and abroad), the consumption of both domestic and imported synthetic gem stones may increase. Assuming adequate supply, imports might be above the 1939 level.

POST-WAR LONG TERM

Because synthetic gem stones are impervious to wear and have many other desirable qualities, it is likely that per capita consumption will increase in the long-term period. It is assumed that the consumption of these stones may follow in a general way the curve of jewelry production. Domestic consumption and imports would therefore be influenced by the duty on medium-priced jewelry. The higher the duty on such jewelry, the more the domestic consumption of gem stones would be increased even if the duty on them should also be increased. The way in which this additional consumption would be divided between domestic and imported stones would, however, depend on relative costs of the two, including the height of the tariff on imported stones, and there is no peacetime experience to serve as a guide. The domestic industry is a war-developed industry and has not been subject to foreign competition even in wartime, still less under more normal conditions. How much of the industry would survive if the tariff duties were the same as the present rates (being also those in effect throughout the greater part of 1939), namely, 20 percent on cut stones and 60 percent on uncut, or if these duties were increased or decreased by 50 percent, is uncertain. Obviously, there would be more assurance of survival (other things being equal) under the higher than under the lower rates.

In view of the foregoing circumstances, it is impracticable to make estimates of production and imports, respectively, based on the several assumptions as to duty. Estimates of consumption, as it might be affected by higher or lower national income, are, however, subject to perhaps somewhat less hazard.

Per capita income at 1939 level.

Consumption of cut synthetic gem stones might be in the neighborhood of \$250,000, varying somewhat with changes in the duties on jewelry. This assumption is based on imports before the war, which supplied almost all United States consumption, with allowance for an increase in per capita consumption over 1939 and an increase in population.

Per capita income 75 percent higher than in 1939.

Consumption of synthetic gem stones might amount to about \$450,000, varying somewhat with changes in the duties on jewelry. This makes allowance for the increased production of jewelry that would occur under a higher income level in the same ratio as estimated in the statement on jewelry.

LACE AND LACE ARTICLES ¹

Tariff paragraph: 1529 (a).

Commodity: Laces and lace articles
(not including wearing apparel or handkerchiefs).

Rates of duty: 45%, 50%, 60%, 65%, and 90% ad val. Equivalent ad valorem (1939): 64%.

NOTE.—The rate fixed in the Tariff Act of 1890 on the articles included in this report was 90 percent ad valorem. The rate on various items was reduced to 45, 50, 60, or 65 percent, pursuant to trade agreements with Belgium (May 1, 1936), Switzerland (February 15, 1936), France (June 15, 1936), and the United Kingdom (January 1, 1939).

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports		Apparent consumption	Ratio of imports (landed value) to consumption
	Total	For domestic market	Foreign value	Landed value		
Levers laces (\$1,000).....	8,631	8,631	2,796	6,481	15,112	Percent 43
Bobbinet (\$1,000).....	842	842	1,801	2,966	3,808	78
Other machine-made laces, and lace articles (\$1,000).....	591	591	790	1,482	2,073	71
Hand-made lace (\$1,000).....			100	189	189	100
Total.....	10,064	10,064	6,476	11,118	21,182	52
Persons employed (number).....	4,250					

¹ Landed value; includes \$6,476,000 foreign value, \$4,156,000 duty, and \$486,000 (7½ percent) landing charges.² Estimated.

The lace-making industry in the United States in 1939 included 653 Levers lace machines, 63 bobbinet machines, and 973 Barmen lace machines. Rhode Island had the largest number of Levers lace machines, and New York the largest number of bobbinet machines; the Barmen lace machines were confined to Pennsylvania and Connecticut.

France is normally the largest producer of Levers lace and is followed by the United Kingdom; the United Kingdom is normally the largest producer of cotton bobbinet; France, of silk and rayon bobbinet; Germany, of Barmen lace.

Levers laces.—Levers lace machines, although not so huge as the Nottingham lace-curtain machines, are large and expensive machines which use much finer yarns and make a greater variety of products. Some are as wide as 224 inches and weigh as much as 12 tons. They range in gage from 5 to 18 points, making lace with 10 to 36 meshes to the inch. In the American industry the machines have a range from 7 to 14 points and make lace with 14 to 28 meshes to the inch. About two-thirds of the domestic machines have 9 to 10 points; less than 10 percent have 12 points or more and are capable of making the finer laces. The domestic industry supplies the bulk of the domestic demand for coarse and medium laces but the large demand for fine

¹ Excluding Nottingham lace-curtain machine manufactures, imports of which are dutiable under paragraph 920 (q. v.).

laces of 12 points or more is supplied mainly by imports, particularly imports from France and to a lesser extent, from the United Kingdom.

Lavers laces, used chiefly for making or ornamenting women's apparel, are subject to fluctuations in demand according to changes in fashion, and heretofore world fashions in lace have been dictated by Parisian couturiers.

Lavers laces include (1) narrow edgings, insertions, and galloons, from $\frac{1}{4}$ inch to 8 inches in width; (2) flouncings, 12 to 54 inches wide; (3) "all-overs," in which the pattern is repeated without top or scallop to the full width of the machine and indefinitely in length; (4) veils and veillings; and (5) miscellaneous articles. In the decade before the war, all-overs predominated in domestic production; imports were largely narrow laces, particularly narrow valenciennes (usually known as vals) in $\frac{1}{4}$ inch to 4-inch widths.

The rate of duty on the coarser Lavers cotton laces which constitute the bulk of the domestic production is unchanged from the 90-percent ad valorem fixed in the Tariff Act of 1930, but rates of duty on other Lavers laces have been changed by trade agreements with France and the United Kingdom. Imports of Lavers machine-made laces in 1939, with rates of duty, were as follows:

	Value (1,000 dollars)	Rate of duty (percent)
Lavers machine-made laces:		
Cotton, 12-point and finer.....	\$2, 558	60
Cotton, coarser than 12-point.....	241	90
Silk, veils and veillings.....	174	65
Silk, other.....	637	65
Rayon, veils and veillings.....	180	65
Rayon, other.....	5	90
Total or average.....	3, 795	63

Bobbinets.—Bobbinets are plain, unfigured, lace fabrics made with hexagonal meshes. Most of them are made of cotton, but substantial amounts of the finer grades are made of silk or rayon.

United States production is mostly cotton bobbinets of coarse and medium grades, particularly mosquito nets. Imports are mostly fine dress nets of cotton, silk, and rayon, from the United Kingdom and France.

On ordinary cotton bobbinets the statutory duty of 90 percent ad valorem has been retained, but on cotton bobbinets having 225 or more holes per square inch (this kind is not made in the United States) the duty was reduced in the United Kingdom trade agreement to 45 percent ad valorem. In the French trade agreement (effective June 15, 1936) the duty on silk and rayon bobbinets was reduced to 65 percent ad valorem, and in the United Kingdom trade agreement the duty on silk bobbinets was further reduced to 60 percent ad valorem. Imports of bobbinets in 1939, with rates of duty, were as follows:

	Value (1,000 dollars)	Rate of duty (percent)
Bobbinets:		
Cotton, having 225 or more holes per square inch.....	\$838	45
Cotton, other.....	151	90
Silk.....	223	60
Rayon.....	589	65
Total or average.....	1, 801	55

Barmen laces.—Barmen laces are produced on circular lace-braiding machines, the plaiting of the threads in lace-like designs being secured by means of a jacquard attachment. These machines are much smaller and cheaper than Levers or bobbinet lace machines. The maximum width that can be produced on such machines is about 7 inches. The material is usually coarse cotton or rayon yarns. The domestic industry supplies most of the domestic demand. Imports, although not separately recorded, are usually very small; before the war, they were mostly from Germany and England. Rate of duty is 90 percent ad valorem.

Bobbinet-Jacquard laces.—The rate of duty on lace and lace articles made on the bobbinet-Jacquard machine was reduced from 90 percent to 50 percent in the trade agreement with France (1936). There are no bobbinet-Jacquard machines in the United States and practically all of those in use are confined to France. They make laces which are similar in appearance to certain styles of Levers laces but are much more costly and therefore noncompetitive. Imports of such laces, commonly known as Lyons-Alençon laces, were valued at about \$89,000 in 1939.

Hand-made laces.—Hand-made lace is not produced on a commercial scale in the United States. Imports are either Chinese or European. The imports from China are mostly the less expensive commercial laces in the form of narrow edgings and insertions; many of them are imitations of the machine-made Levers laces, which they undersell on the American market despite a duty of 90 percent ad valorem. The imports from Europe, mainly from Belgium and Italy, are relatively small in quantity. These are mostly fine high-priced artistic laces (many of them museum pieces) and are not competitive with anything made in the United States. The duty on those exceeding 2 inches in width was reduced in the trade agreement with Belgium (effective May 1, 1935) to 60 percent ad valorem if valued at more than \$50 and less than \$150 per pound, and to 45 percent ad valorem if valued at \$150 or more per pound.

POST-WAR SHORT TERM

Judging by the period which followed World War I, it seems likely that World War II will be followed by a strong revival in the demand for laces. This increase in demand will probably be of greatest benefit to the domestic lace mills and will result in production much larger than that of 1939. If the extent of the war damage to the lace mills at Calais, the largest producer of fine laces, proves to be as great as currently reported, imports of laces into the United States may be reduced to less than those of 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Lace is peculiarly subject to changes of fashion. In the estimates which follow, it is assumed that the element of fashion in the total demand and in the relative demand for different types will be about the same as in 1939. As that element is largely unpredictable, however, the estimates are subject to more than the usual possibility of error.

Per capita income at 1939 level.

Assuming that per capita consumption would be about the same in quantity as in 1939, but allowing for a 10-percent increase in population and an increase in unit prices, resulting primarily from higher prices for cotton yarns, total consumption might be 25-30 million dollars, depending on the rates of duty.

Duty as in 1939.—Imports would probably supply about the same proportion of consumption as in 1939. Assuming for both imports and production a 10-percent increase in quantity (because of population increase) and a 20-percent increase in unit prices (as compared with 1939) imports would have a foreign value of about 8½ million dollars and a landed value of about 14½ million dollars; domestic production would be valued at about 13 million dollars.

Duty reduced by 50 percent.—The quantity of imports might be 50-80 percent greater than if the duty had been unchanged, but the increase in the value probably would be less because of the inclusion of a larger percentage of lower-quality laces. The total foreign value of imports might be 10-13 million dollars, and the landed value 14-18 million, constituting about 58 percent of consumption. Production possibly would be about 20 percent less in quantity and 15 percent less in unit prices than if the duty had been unchanged; it would then amount to about 9 million dollars a year.

Duty increased by 50 percent.—Imports might be about 15-25 percent less in quantity than if the duty had been unchanged, but with unit prices probably about 10 percent higher because of restriction to the higher qualities. The total foreign value of imports might be between 7-8 million dollars a year and the landed value 14-16 million, or about 55 percent of consumption. Production possibly would be 10 percent greater in quantity and possibly 5 percent greater in unit prices than if the duty had been unchanged. The total value of production then would be about 15 million dollars a year.

Per capita income 75 percent higher than in 1939.

Laces in general are luxury items, the consumption of which undergoes a relatively great increase with an increase in per capita income. At the higher income level the quantity of consumption might increase as much as 60 percent, and the increase in the average of unit prices might be about 25 percent over that at the lower income level. The total value of consumption then would be 50-60 million dollars a year, or about twice as great as if per capita income had remained the same as in 1939. It is assumed that the same ratio of increase would apply to both production and imports under a given condition as to rate of duty. On this basis, the following estimates are derived from those previously made for production and imports with per capita income the same as in 1939.

Duty as in 1939.—Imports might supply about the same proportion of consumption as in 1939 and have a foreign value of about 17 million dollars, and a landed value of 29 million dollars. The value of production possibly would be about 26 million dollars a year.

Duty reduced by 50 percent.—Imports might have a foreign value of 20-26 million dollars, and a landed value of 28-36 million (about 58 percent of consumption). The value of production possibly would be about 18 million dollars a year.

Duty increased by 50 percent.—The foreign value of imports might be 14–16 million dollars and the landed value, 28–32 million (about 55 percent of consumption). The value of production possibly would be about 30 million dollars a year.

Exports

United States exports of laces and lace articles, although not separately recorded, have never been large, and probably no significant quantity can be exported in the future.

Employment

Assuming the same ratio of employment to production as in 1939, under the assumptions already made as to duty and national income employment might range from 4,500 to 7,000 persons. A reduction of 50 percent in the duty might cause employment to be about 10–15 percent less, and an increase of 50 percent in the duty might cause it to be 3–4 percent greater than it would otherwise have been.

EMBROIDERED HOUSEHOLD ARTICLES

Tariff paragraph: 1529 (a).

Commodity: Fabrics and articles ornamented with embroidery, lace, etc., (not including wearing apparel or handkerchiefs).

Rate of duty: 60% and 90% ad val. *Equivalent ad valorem (1939):* On imports from the dutiable imports, 87%.
Philippines duty free.

NOTE.—The articles covered by this report were all dutiable at 90 percent ad valorem under the Tariff Act of 1930. The rate on various items was reduced to 60 percent, effective February 15, 1941, pursuant to trade agreement with Switzerland.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Value (\$1,000).....	\$ 4,000	\$ 7,879	11,879	Percent 66

¹ Production in continental United States and Puerto Rico.

² Estimated.

³ Landed value; includes \$4,282,000 foreign value, \$3,383,000 duty, and \$214,000 (5 percent) for landing charges. The foreign value includes \$415,000 worth of articles entered from the Philippines duty-free.

Embroidered articles (except wearing apparel and handkerchiefs) include some yard goods (in the piece), but are mostly household articles such as embroidered tablecloths, table runners, table mats, doilies, luncheon sets, bridge sets, pillowcases, and guest towels. The basic material in such embroideries made in continental United States and in Puerto Rico is mainly cotton cloth, followed by linen. The basic material in imports is principally linen cloth, followed by cotton. This group is usually known as decorative household linens.

Production of this class of embroideries in continental United States, predominantly by machine, is not separately recorded, but has been roughly estimated at more than 3 million dollars in 1939. Shipments of hand-embroidered household articles from Puerto Rico to the United States in 1939 were valued at \$896,000. Production in continental United States and Puerto Rico combined may, therefore, be estimated for 1939 at approximately 4 million dollars.

United States imports of embroidered articles (not including wearing apparel or handkerchiefs) in 1939 had a foreign value of 4.3 million dollars. Nearly two-thirds came from China; other sources were the Philippines (\$415,000 duty-free), the Madeira and Canary Islands, Japan, Italy, France, and the United Kingdom. All imports from Asia and most of those from Europe were embroidered by hand.

POST-WAR SHORT TERM

The demand for embroidered household articles is influenced to some extent by current fashions, but it appears probable that after the war the demand will be very strong for domestic machine-made as well as for Puerto Rican and foreign hand-made embroideries of this class. Resumption of imports from China will probably result in a return to the pre-war condition of a preponderance of foreign hand-embroidered articles.

POST-WAR LONG TERM

Consumption, Production, and Imports

In the following estimates of imports it is assumed that, in accordance with the provisions of existing law, imports from the Philippines in the long-term post-war period will be subject to the same duties as those from other foreign countries. The imposition of duties on the Philippine products might materially reduce the imports from that source, but it would probably have no great effect in reducing total consumption or total imports, or in increasing production in the United States; the principal effect would probably be a shift of the sources of imports to other countries, especially China. Since the imports from the Philippines were a relatively small proportion of the total imports, any error in this assumption as to the effect of the imposition of duties on the Philippine articles cannot result in any considerable margin of error in the estimates of total imports, consumption, or production.

Per capita income at 1939 level.

Duty as in 1939.—The demand for embroidered household articles is influenced somewhat by the current vogue and by the competition from unembroidered types, such as those made from bleached, printed, or colored fabrics. On the assumption that this competition will be about the same as in 1939, the increase in population will result in a 10-percent increase in quantity. Assuming a 20-percent increase in unit values (chiefly by reason of a higher price for cotton), total values of both imports and production would be about 32 percent above those of 1939. The value of consumption might be 15.8 million dollars. Imports would have a foreign value of 5.7 million dollars (10.5 million dollars, landed value), and production would be valued at 5.3 million dollars.

Duty reduced by 50 percent.—Consumption might be valued at 17.3 million dollars. Imports would probably be double those of 1939 in quantity, and assuming only a 10-percent increase over 1939 in unit values (because of the inclusion of a larger percentage of lower grade goods) instead of 20 percent, as above, the total foreign value would be about 9.5 million dollars (13.7 million dollars, landed value). Assuming a 10-percent decrease in quantity of production, and with unit values as in 1939 because of the increase in competition from abroad, the total value of production would be about 3.6 million dollars.

Duty increased by 50 percent.—Consumption might decrease to 15.6 million dollars. With the duty averaging about 120 percent ad valorem, imports would probably decrease at least a third in quantity, and be confined to high-grade articles having an average unit value 50 percent above that of 1939. The total foreign value of imports would then be the same as in 1939, or about 4.3 million dollars (9.6 million dollars, landed value). On the assumption that production would increase 20 percent in quantity and that unit values would be 25 percent above those in 1939, the total value of production would be about 6 million dollars.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—Consumption might be about 50 percent greater than with income unchanged and might amount to 23.3 million dollars. Both imports and production would increase substantially in quantity, possibly about 35 percent above the figures based on an unchanged income. Assuming that unit values of both imports and domestic production increased 10–15 percent over the prices at the lower income level, the foreign value of imports would be about 8.4 million dollars (15.5 million dollars, landed value), and the value of production would be about 7.8 million dollars.

Duty reduced 50 percent.—Consumption might increase to 27.7 million dollars. Imports would probably be at least 60 percent greater in quantity than with an unchanged duty, and assuming only a 10-percent increase in unit values (because of the inclusion of a larger proportion of low-grade goods), the total foreign value would be about 15.5 million dollars (22.4 million dollars landed value). Under the impact of the larger imports, production would probably decrease both in quantity and in unit value from the figures estimated above with the duties unchanged; the total value of production might be about 5.3 million dollars.

Duty increased 50 percent.—Consumption might be valued at 23 million dollars. Imports might be much smaller in quantity than with the duty as in 1939, but because of restriction to high grades, might be considerably higher in unit value. The total foreign value then would be about 6.5 million dollars (14.5 million dollars landed value). Production might, therefore, have a total value of about 8.4 million dollars.

Exports

United States exports of household articles ornamented with embroidery and so forth are not separately recorded, but are known to be negligible.

Employment

Separate data are not available as to the number of factory and home workers engaged in continental United States and Puerto Rico in embroidering or otherwise ornamenting household articles.

WEARING APPAREL, EMBROIDERED, ETC.

Tariff paragraph: 1529 (a).

Commodity: Wearing apparel ornamented with embroidery, lace, etc.

Rates of duty: From the Philippines, free; from other countries, 50%, 60%, 65%, 75%, or 90% ad val. *Equivalent ad valorem (1939):* On dutiable imports, 80%.

NOTE.—The rates fixed in the Tariff Act of 1930 were 90 percent or 75 percent ad valorem. Reductions in duty on certain items became effective on June 15, 1936, and January 1, 1939, pursuant to the trade agreements with France and the United Kingdom.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total ¹	For export	For domestic market			
Value (\$1,000).....	\$ 47,400	\$ 100	\$ 47,300	\$ 8,815	53,115	Percent 18

¹ Value of domestic production estimated at about \$40,000,000, plus shipments from Puerto Rico valued at \$7,377,000.

² Estimated.

³ Landed value; it includes \$7,315,000 foreign value, \$1,134,000 duty, and \$266,000 (5 percent) landing charges. Foreign value includes \$5,900,000 worth of articles entered from the Philippines duty-free.

Embroidery is ornamental stitching and requires a foundation such as cloth, net, or other fabric, on which it is worked. Embroidery may be done by hand or by machine. Machine-made embroideries are produced on (1) schiffli (shuttle) embroidery machines, many of them as wide as 15 feet; these are multi-needle machines, power-driven, and usually equipped with automatic Jacquard attachments; (2) "Swiss" hand-embroidery machines averaging 6 feet in width; these are multi-needle machines, operated by hand; and (3) Bonnaz or Cornely one-needle stitching machines, operated by hand or power. Most of the embroideries produced in Switzerland, Germany, the United Kingdom, and continental United States are machine-made, whereas those produced in China, Japan, the Philippines, the Madeira and Canary Islands, and Puerto Rico are hand-made, as are most of those produced in countries such as Italy and France.

Data are not available as to the quantity or value of the embroideries produced in continental United States. The domestic industry includes contract factories which work on material supplied by others, and regular factories which own their materials and sell finished products. Including sales by the regular factories and receipts for work done by contract factories, the total receipts of embroidery factories in 1939 were 24.4 million dollars, of which 13.7 million dollars was for

schiffli-machine work, 6.1 million dollars for Bonnaz and Cornely machine work, and 4.6 million dollars for work done on hand machines or that done by hand. The value of the embroidered goods produced may be estimated at about double the total receipts shown above, or about 50 million dollars. Deducting the value of embroidered handkerchiefs and embroidered household articles (both of which are discussed elsewhere), the value of the embroidered wearing apparel produced by the industry of continental United States was probably in the neighborhood of 40 million dollars. The center for the production of schiffli and hand-machine embroidery is in northern New Jersey, whereas that for single-needle-machine (Bonnaz and Cornely) embroidery and hand embroidery is in New York City.

In addition to the production in continental United States there is also considerable production in Puerto Rico. Shipments of embroidered wearing apparel from Puerto Rico to the United States in 1939, all hand-embroidered, were valued at 7.4 million dollars. Total United States production is therefore estimated to have been 47.4 million dollars.

Imports of embroidered wearing apparel in 1939 (including a small quantity ornamented with lace) had a foreign value of 7.3 million dollars. Of this total, 5.9 million dollars, or 81 percent, entered duty-free from the Philippine Islands, and consisted mainly of women's underwear, slips, and nightgowns, children's dresses, and infants' wear, all hand-embroidered and mostly of cotton. Dutiable imports in 1939 were largely from China, Japan, and France. The principal dutiable imports were (1) embroidered silk wearing apparel, mainly from China (of Oriental types such as coolie coats, mandarin coats, kimonos, and pajamas), with some from France, Japan, and other countries (\$479,000); (2) embroidered gloves and mittens of wool, mainly from China and Japan (\$266,000); (3) embroidered rayon wearing apparel, mainly from Japan (\$203,000); and (4) cotton hosiery with embroidered clocking, mainly from France (\$98,000). Total imports in the decade before the war increased steadily from 2.8 million dollars in 1933 to 7.3 million dollars in 1939.

In the following estimates it is assumed that, in accordance with existing law (the Philippine Independence Act), imports from the Philippine Islands will, not later than July 4, 1946, become subject to the same duties as imports from other foreign countries. The imposition of full duties on the Philippine products would materially reduce imports from that country and would probably result in a decrease in total imports. It is possible, however, that some new arrangement may be made with the Philippine Islands whereby United States imports of Philippine embroideries will be accorded some form of preferential treatment for some time beyond July 4, 1946. There are, of course, various intermediate possibilities between entire freedom of trade and the application of the full duties. Any such change, were its duration to extend into the long-term period, would necessitate a modification of the estimates herein made on the basis of the provisions in existing law.

POST-WAR SHORT TERM

It appears probable that embroidered wearing apparel for women, children, and infants will be in strong demand after the war and that consumption will be considerably greater than in 1939. As heretofore,

the bulk of this consumption will doubtless be supplied by the industry in continental United States and Puerto Rico. It seems likely that imports will be smaller than in 1939 for, irrespective of the ultimate effect of the Philippine Independence Act, or any modification thereof, it may take some time to reestablish the hand-embroidery industry in the Far East.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The demand for wearing apparel ornamented with embroidery or lace fluctuates with fashion trends, but it is here assumed that such ornamentation will be as popular in the long run as in 1939.

Imports of wearing apparel ornamented with embroidery or lace in 1939 included 5.9 million dollars worth from the Philippine Islands free of duty and 1.4 million dollars worth from other countries with duty averaging 80 percent ad valorem. If imports from the Philippines become dutiable at the full rate, they will probably amount, at most, to only a small fraction of the quantity received before the war. Only if living standards in the Philippine industry were to be depressed to, or even below, the level in other producing areas of the Far East, does it seem possible that the Philippines could export to the United States any sizeable quantities of embroidered apparel such as they exported in the pre-war period.

Probably only a small part of the deficit in imports from the Philippines would be replaced by increased imports from other countries. The greater part of it would probably be replaced by embroidery produced in continental United States and Puerto Rico, largely consisting, however, of machine-ornamented rather than of hand-ornamented garments. There might be some slight decline in total consumption of embroidered wearing apparel, including both hand-made and machine-made; but for the most part the effect on consumers of making all imports subject to a duty of about 80 percent ad valorem (i. e., on the assumption of the duty as in 1939) would be to bring about a shift from hand-made to machine-made embroidery.

Duty as in 1939.—On the foregoing assumptions, it seems probable that the total quantity of embroidered wearing apparel imported would not be more than one-third as much as in 1939; it might amount to not more than 2.4 million dollars, based on foreign value computed at 1939 prices, with possibly \$400,000 worth coming from the Philippines, and 2.0 million dollars worth coming from other countries. Allowing for a 20-percent increase in unit prices, mainly because of higher costs of the basic fabrics, the foreign value of the imports might be in the neighborhood of 2.9 million dollars, and the landed value might be approximately 5.4 million dollars.

The value of domestic production (continental United States and Puerto Rico) in 1939 has been estimated at approximately 47.4 million dollars. In accordance with the assumptions as to replacement of imports from the Philippines by domestic production,¹ as discussed above, and allowing both for a 10-percent increase in population and for a 20-percent rise in prices as indicated above, total domestic production would be 72.6 million dollars. Adding to this

¹ The landed value of the imports assumed to be so displaced (twice that of the imports actually entering) would be 10.8 million dollars.

figure the landed value of imports, as estimated above, namely 8.4 million dollars, total consumption of embroidered wearing apparel would be valued at 78 million dollars.

Duty reduced by 50 percent.—With the duty averaging 40 percent ad valorem, the quantity of imports might be double that estimated with the duty at 80 percent. Allowing for the 20-percent price increase mentioned above, resulting from increased cost of materials, imports would have a foreign value of 5.8 million dollars, and a landed value of approximately 8.4 million dollars. On the basis of consumption valued at 78 million dollars (and disregarding the possible slight increase of consumption under these conditions), production would thus be valued at 69.6 million dollars.

Duty increased by 50 percent.—With the duty averaging 120 percent ad valorem the quantity of imports might be only half of that estimated above with the duty unchanged, but unit prices would probably be 25 percent higher, because imports would probably consist chiefly of the higher-quality apparel. The landed value of imports might therefore be about 4.1 million dollars (1.8 million dollars, foreign value). Disregarding the possible slight decrease of consumption under these conditions, production would then be valued at approximately 73.9 million dollars.

Per capita income 75 percent higher than in 1939.

Ornamentation of wearing apparel with embroidery, etc. is in the nature of a luxury, but on many types of apparel, particularly infants' wear and nightgowns, it has become so customary that it is almost a necessity in the sale of the articles. Whether regarded as a luxury or a necessity, the ornamentation entails an added cost, and therefore a higher price has to be charged for embroidered as compared with nonembroidered goods of the same type. Although the vogue for embroideries varies, an increase in per capita income almost invariably results in an expansion of the demand for embroidered or otherwise ornamented wearing apparel.

Consumption would probably be 50 percent larger than with income as in 1939, and unit prices might be 10 percent above those estimated for the lower income level. Consumption would thus be valued at 128.5 million dollars. For reasons indicated, the effects of duty changes on the amount of embroidered wearing apparel consumed would probably not be great enough to warrant separate estimates.

Duty as in 1939.—Imports would probably supply the same proportion as under the lower income level. They might have a landed value of 8.6 million dollars (4.6 million dollars, foreign value). Production for the domestic market would then have a value of 120 million dollars.

Duty reduced by 50 percent.—Imports might double in quantity without any appreciable change in unit prices, and might have a landed value of 13.3 million dollars (9.2 million dollars, foreign value). Under these circumstances production for the domestic market would be valued at 115.2 million dollars.

Duty increased by 50 percent.—The quantity of imports might be only half that estimated with the duty unchanged, but average unit prices might be 25 percent higher because imports would probably consist mostly of higher-quality apparels. Imports might thus have a landed value of 6.5 million dollars (2.9 million dollars, foreign value).

Production for the domestic market would then be valued at 172 million dollars.

Exports

United States exports of embroideries are not separately recorded. In 1939, exports listed as "Cotton laces, embroideries, and lace window curtains" were valued at \$202,000, of which the embroideries alone may be estimated at about half, say, \$100,000. Future exports are not likely to exceed this amount. Canada and Cuba are the principal purchasers.

Employment

Separate data are not available as to the number of factory and home workers in continental United States and Puerto Rico engaged in embroidering or otherwise ornamenting wearing apparel.

EMBROIDERED HANDKERCHIEFS

Tarif paragraph: 1520 (b)
Commodity: Handkerchiefs ornamented with embroidery, applique, or drawn work, or in part of lace.

Rates of duty: 25¢ or 35¢ each + 30%, or 35¢ or 45¢ each + 40%. Equivalent ad valorem (1939): 84%.

Note.—The rates fixed by the Tariff Act of 1930 were 2 cents each plus 30 percent ad valorem on handkerchiefs valued at 75 cents or less per dozen; 3¢ plus 30 percent on those valued at more than 75 cents per dozen. An additional duty of 1 cent each was imposed on the lower value items if the hands were made wholly of hand-made lace. The rates were reduced to 1 cent each plus 30 percent ad valorem to the hands ornamented with hand-made lace or drawn work, or in part of lace. On certain other handkerchiefs the reduced rate of 1 cent each plus 30 percent ad valorem was given if the hands were made wholly of hand-made lace or machine-made lace, or in part of lace, or in part of lace and without finished edges, and all handkerchiefs valued at 30 cents or more per dozen and ornamented with hand-made lace or machine-made lace. The additional duty of 1 cent each on handkerchiefs valued at 75 cents or less per dozen was reduced to 50 cents if the hands were made wholly of hand-made lace or machine-made lace. On January 1, 1931, the provision was modified to exclude from its benefits handkerchiefs ornamented by hand with applique or drawn work.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 dozen)	110,000	1,000	10,000	Percent 10
Value (\$,000)	10,000	1,000	12,000	Percent 8.3
Unit value (per dozen)	\$1.00			

¹ Production in continental United States and Puerto Rico. Exports were negligible.
² Estimated.
³ Landed value; it includes \$2,514,000 foreign value, \$2,185,000 duty, and \$181,000 (5 percent) landing charges.

Handkerchiefs dutiable under paragraph 1520 (b) are ornamented, by hand or machine, with embroidery, applique, cut work, punch work, drawn work, or other forms of fancy needlework, or are made or trimmed with hand-made or machine-made lace. Most of them are embroidered; those containing lace constitute a small proportion of the total.

Of some 48 million dozen handkerchiefs (35.8 million dozen made in continental United States, 5.5 million made in Puerto Rico, and 7 million imported) available for consumption in the United States in 1939, those ornamented with embroidery apparently constituted about 27 percent, or 13 million dozen (6.5 million dozen ornamented in continental United States, 3.5 million ornamented in Puerto Rico, and 3 million imported).

Production in continental United States of about 6.5 million dozen embroidered handkerchiefs in 1939 is indicated by census reports, which showed 5.9 million dozen embroidered at a cost of 1.2 million dollars, and an unrecorded quantity sold for \$395,000. New Jersey was the main producer.

Shipments of handkerchiefs from Puerto Rico to the continental United States in 1939 were recorded as about 6.5 million dozen, valued at about 6.4 million dollars; nearly 3.7 million dozen of these were cotton, averaging \$0.79 a dozen; and 2.9 million dozen were linen, averaging \$1.24 a dozen. These shipments included (1) handkerchiefs made and ornamented by hand in Puerto Rico, with or without hand-rolled hems; (2) handkerchiefs embroidered by machine in continental United States and sent to Puerto Rico to be completed with hand-rolled hems; and (3) handkerchiefs with hand-rolled hems but no embroidery. The number included which were made and embroidered by hand in Puerto Rico is not separately recorded, but may be estimated at approximately half of the total shipments, say 3.5 million dozen. On this basis, the combined production of embroidered handkerchiefs in continental United States and in Puerto Rico in 1939 totaled about 10 million dozen.

United States imports of embroidered handkerchiefs in 1939 were 3 million dozen, with a foreign value of 2.6 million dollars. About 90 percent in terms of quantity and 82 percent in terms of value were from China; most of the remainder came from Switzerland and the Madeira Islands. About 97 percent were linen. With the exception of the small quantity from Switzerland, virtually all were embroidered or otherwise ornamented by hand, and most were also made with hand-rolled hems.

POST-WAR SHORT TERM

The immediate post-war demand for ornamented handkerchiefs will probably be substantially above that in 1939. The bulk of this demand will be supplied, as heretofore, by domestic production, but there will also be a large increase in imports, including not only hand-embroidered handkerchiefs from China but also machine-embroidered handkerchiefs from Switzerland.

POST-WAR LONG TERM

Consumption, Production, and Imports

It is assumed that the competitive position of Puerto Rico will be substantially the same as it was in 1939.

Per capita income at 1939 level.

Duty as in 1939.—Taking into consideration the pre-war trend toward the ornamentation (with embroidery or other forms of fancy needlework) of a larger percentage of the total handkerchiefs, and the increase in population, it is probable that both imports and produc-

tion may be about 20 percent higher in quantity than in 1939. Assuming that unit prices for both imports and production will increase 20 percent because of the likelihood of increased costs, particularly of cotton, the imported handkerchiefs would be valued at about \$1.04 (foreign value) per dozen, and the domestic handkerchiefs at \$1.20 a dozen. Imports would then be 3.6 million dozen, with a foreign value of about 3.7 million dollars, and production (in continental United States and Puerto Rico) would be about 12 million dozen, valued at 14.5 million dollars.

Duty reduced by 50 percent.—Imports might be about two-thirds greater in quantity than with duties as in 1939 but, because of the inclusion of a larger percentage of low-grade goods, unit prices might be about 10 percent lower. Imports would then be about 6 million dozen, with a foreign value of about 5.7 million dollars. Production might be about one-sixth less than with unchanged duties; that is, 10 million dozen valued at 10 million dollars, prices declining materially because of increased competition of imports.

Duty increased by 50 percent.—Imports might be about 40–50 percent less in quantity than at the 1939 rates of duty and be confined to ornamented handkerchiefs of the higher grades with unit prices averaging perhaps 20 percent higher. If so, imports would be about 2 million dozen with a foreign value of about 2.4 million dollars. Production might be about 13 million dozen valued at 17 million dollars, prices being somewhat higher than with unchanged duties.

Per capita income 75 percent higher than in 1939.

Duty as in 1939.—The increase in purchasing power would undoubtedly stimulate the demand for handkerchiefs ornamented with embroidery or other forms of fancy needlework. Both imports and production might be about one-fourth greater in quantity, and one-tenth higher in unit prices, than with income as in 1939. Imports would then be about 4.5 million dozen, with a foreign value of 5.2 million dollars, and production would be about 15 million dozen, valued at 20 million dollars.

Duty reduced by 50 percent.—Imports would probably increase sharply and might be twice as great in quantity as with unchanged duties; because of the inclusion of a larger percentage of low-grade goods, however, the average price might be considerably lower than with duties as in 1939. Imports might thus be about 9 million dozen, with a foreign value of about 9.4 million dollars. Domestic production might be about 12 million dozen, valued at 13.5 million dollars.

Duty increased by 50 percent.—Imports might drop in quantity to 3 million dozen, but, because of higher average unit values, might have a total foreign value of 3.9 million dollars. Production might be about 15 million dozen, valued at 21 million dollars.

Exports

United States exports of handkerchiefs embroidered or otherwise ornamented are not separately recorded, but are known to be small.

Employment

Data are not available to show the number of workers engaged in embroidering or otherwise ornamenting handkerchiefs in continental United States and Puerto Rico. Much of this work is carried on in

connection with the ornamentation of wearing apparel and other goods; besides, since many of the workers in continental United States and many more of those in Puerto Rico are home workers, enumeration of them is difficult.

CORSETS AND ALLIED GARMENTS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1529 (c)	Corsets, girdle-corsets, step-in corsets, brassieres, and similar body-supporting garments (except ornamented as provided for in paragraph 1529 (a)):		
	Not containing elastic fabric	50%	54.9%
	Containing elastic fabric	55%	

Note.—The rates fixed in the Tariff Act of 1930 were 60 percent on garments not containing elastic fabric and 75 percent on garments containing elastic fabric. They were changed in the trade agreement with France, effective June 15, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹			Imports ²	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (million dollars).....	54.4	2.0	52.4	\$ 0.24	\$ 52.6	Percent 0.3
Unit value (per garment).....		\$6.68				
Persons employed (number).....	18,765					

¹ Production data are for all corsets and allied garments, whether or not ornamented with lace or embroidery or by any of the methods described in par. 1529 (a) of the tariff act; imports represent garments not covered by par. 1529 (a). Imports of ornamented corsets, etc., dutiable under par. 1529 (a) had an average annual foreign value of \$30,000 in the 5 years 1931-35, when the duty was 50 percent ad valorem, and an average annual foreign value of \$40,000 in the 5 years 1936-39, during most of which period the duty was 75 percent ad valorem.

² Estimated landed value; it includes \$146,305 foreign value, \$62,116 duty, and \$7,475 (5 percent) landing charges.

³ Estimated.

The value of production of corsets and allied garments in 1939 was the highest on record. Production of girdles and simple types of foundation garments has developed, particularly in the knit underwear industry, and has been facilitated by improvements in rubber threads dating from the early 1930's.

No quantitative data of production are available, but a study of the value of production in relation to national income, population, and price changes indicates that demand is well-maintained in depression years and that, in years of unusually high national income, expenditure for these garments does not go up proportionately.

Manufacture in the United States is on a mass-production basis. Although a large number of the 272 establishments in the industry in 1939 were small concerns, the average value of output per establishment was considerably higher than in most clothing industries. The highest level of employment was in 1914, when 20,496 wage earners produced garments of this type valued at 40.6 million dollars. The number of workers declined at each census to the low point of 13,664 in 1929. Some of this decline may have been due to production

of fewer garments, but it probably was mainly attributable to increased efficiency resulting from the use of high-speed stitching and seaming machines, the development of straight-line methods of production, and the designing of less intricate garments, made possible both by improved materials and improved seaming machines. Since 1929 there has been a steady increase in the number of wage earners in the industry; the increase is perhaps attributable in part to shorter working hours but is mainly a result of increased production.

Garments of highest quality are produced by relatively few concerns. Much of the elastic fabric, supporter elastic, lace, and batiste used in making these high-priced garments is imported. In general, however, most of the materials used in the industry are of domestic manufacture.

United States manufacturers of corsets and similar garments have established reputations in foreign markets, and the United States is on a net export basis for these articles. The value of exports averages about 2 percent of production; the average for the 20 years 1920-39 was somewhat more than 1.5 million dollars. The value of exports declined from 2.2 million dollars in 1926 to 0.6 million dollars in 1933 but increased again each year through 1939, when it was 2 million dollars. The principal markets are the Union of South Africa, the United Kingdom, the Netherlands, and Latin-American countries.

In the 9 pre-war years for which statistics are available, imports of corsets and similar garments, not ornamented, had an average foreign value of \$202,000; the highest value was \$318,000 in 1931, and the lowest, \$150,000 in 1939. In 1939, garments containing elastic fabric constituted almost all of the imports; most garments are made with sections of "hand-loomed" elastic, that is, actually knit on hand-operated knitting frames (see the discussion on elastic fabric). France supplied more than 90 percent of total imports in the period 1931-39. The importations from France were luxury articles, retailing in the United States at \$15 to \$150 for each corset or combination. In this limited field, imports in the period 1931-39 are estimated to have equaled about 10 percent of comparable domestic production.

POST-WAR SHORT TERM

Because of the scarcity of elastic fabrics, garments of this class which have been produced during the war have been insufficient in number and unsatisfactory in quality. The demand for moderate-priced good-quality merchandise will doubtless continue to be strong for some time after the end of the war. If such garments can be supplied by foreign countries, imports may help to fill domestic requirements; but, on the whole, American women prefer the garments of American make to any other but the French, and the French garments are too expensive to meet the average retailer's price range.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption would probably increase about in proportion to the increase in population and, at prices only slightly higher than in 1939, would have a value of about 91 million dollars. Production for the domestic market might also be about 10 percent larger than in 1939,

with a value of 90-91 million dollars, depending on the rates of duty. Since imports are much smaller than exports and are very small in relation to domestic production and consumption, changes in duty could scarcely have more than a negligible effect on total production and consumption.

Duty as in 1939.—Imports might be at approximately the average value of 1931-39. Assuming prices at very little above the 1939 level, they would have a foreign value of 0.2 million dollars, or about 34 percent more than in 1939.

Duty reduced by 50 percent.—Imports might be five times those with the duties as in 1939, and have a foreign value of about 1 million dollars. They would then constitute about 1 percent of the total value of consumption.

Duty increased by 50 percent.—Imports might be one-fourth less than with the duty unchanged and might have a foreign value of 0.15 million dollars. They would then constitute less than 0.2 percent of the total value of consumption.

Per capita income 75 percent higher than in 1939.

Consumption might be 15 percent larger in quantity than with income as in 1939 and, because at such an income level there would probably be a large demand for the more expensive garments, the average unit value might increase 30 percent. Consumption might thus be valued at about 137 million dollars. Production for the domestic market might have a value of 135.5-137.0 million dollars. Changes in the duties by 50 percent would have only a slight effect on production and consumption, since the proportion supplied by imports would remain very small under all duty assumptions.

Duty as in 1939.—Imports would probably have a total foreign value about 50 percent above that at the low income level, or about 0.3 million dollars. They would, however, constitute less than 0.3 percent of the value of consumption.

Duty decreased by 50 percent.—Imports might have a foreign value of about 1.5 million dollars, or about 1 percent of the total value of consumption. The foreign value of imports would then be about 10 times that in 1939.

Duty increased by 50 percent.—Imports might decline somewhat below the level estimated if there were no change in duty. They might be expected to supply about 0.2 percent of the total value of consumption, or to have a foreign value of about 0.25 million dollars.

Exports

With world income as in 1939 exports might have a value equal to the average for the years 1936-39, or 1.8 million dollars. With increased world income, and assuming no higher trade barriers than in 1939, exports might increase to 2.5 million dollars.

Employment

With per capita income at the 1939 level, employment might be in the neighborhood of 20,000 workers. With per capita income 75 percent higher than in 1939, the number of workers employed might be about 23,000.

ELASTIC FABRICS

Tariff paragraph: 1529 (c).

Commodity: Elastic fabrics of whatever material composed, knit, woven, or braided, in part of india rubber.

Rate of duty: 40% ad val.

NOTE.—Pursuant to the trade agreement with France, effective June 15, 1936, the rate of duty was reduced from 60 to 40 percent ad valorem.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	1 20,064	940	19,124	299	19,413	Percent 1.5

¹ Includes elastic webbing (produced in the cotton narrow-fabrics industry) valued at \$16,064,000, and elastic corset fabrics more than 12 inches in width, not separately recorded, but estimated to have been valued at 4 million dollars.

² Landed value; it includes foreign value, duty, and 5-percent landing charges. Foreign value was \$199,000.

Elastic fabrics containing india rubber may be divided into two groups: (1) "Narrow" elastic fabrics, not more than 12 inches in width, produced on a yardage basis in the cotton smallware industry, and (2) elastic corset fabrics, which are usually made in wide widths or in separate pieces of 12 by 20 inches and 14 by 21 inches by concerns specializing in elastic goods. Narrow elastic fabrics are used in the production of such articles as garters, suspenders, supporters, and parts of underwear. The wider elastic fabrics are used in brassieres, corsets, and other body-supporting garments.

Practically the same materials are used whether for braided, woven, or knit elastic fabrics. The rubber is either in square threads cut from rubber sheets of the appropriate thickness, or in round threads formed by extrusion of latex through an orifice. This round rubber thread called "lastex" is made under an American patent, which some foreign manufacturers have been licensed to use. It has been on the market since the latter part of 1931. Rubber threads, square-cut or round, may be used uncovered or covered with yarn. Any textile yarn may be used for this covering, but usually it is fine cotton or cotton and rayon. Fabrics made from lastex yarn are lighter in weight than those formerly made from square-cut rubber threads. Fine rubber threads have made possible the two-way stretch fabrics because they can be used as both warp and filling threads in weaving, and for the actual loop formation in knitting.

The bulk of domestic production consists of narrow fabrics. Total production of woven and braided narrow fabrics was valued at 25.1 million dollars in 1929, at 14.9 million in 1937 and 16.1 million in 1939. Production of elastic corset fabrics is not separately recorded.

Imports are mainly "hand-loomed" corset strips (knit on hand frames). Supporter elastic, usually in Jacquard design, is also imported in small quantities. Total imports were valued at \$205,000

in 1931, \$161,000 in 1935, and \$255,000 in 1937. France furnished more than 75 percent of the total before 1936, and 56 percent in 1939. Japan supplied 29 percent in 1937, 24 percent in 1938, and 31 percent in 1939. Imports from the United Kingdom during the thirties were 15-20 percent of the total value.

Exports, consisting mainly of narrow elastic fabrics, declined from \$1,476,000 in 1929 to \$353,000 in 1933 and rose to \$940,000 in 1939. The United Kingdom, Australia, Canada, and Cuba have been the principal markets.

In the estimates which follow it is assumed that the demand for both narrow elastic fabrics and elastic corset cloth (in part of india rubber) will continue after the war. Narrow fabrics used in the production of garters, suspenders, and parts of underwear, will probably be made with rubber threads as in the pre-war period. On the other hand, progress has been achieved in the production of elastic fabrics without rubber, and if larger quantities of satisfactory corset fabric are produced from nylon, vinyon, or other synthetic yarn, the value of production, imports and exports of elastic fabrics using rubber in the long-term post-war period might be much smaller than indicated.

POST-WAR SHORT TERM

During the war the narrow-ware industry has been engaged principally in the production of nonelastic webbing for Government order. This limitation, together with the scarcity of rubber during the war, will increase the demand for elastic fabrics in the immediate post-war period. Production in the United States of both elastic webbing and elastic corset cloth might be 20 to 30 percent greater than in 1939. Imports will probably be negligible, particularly since France will need to replace stocks which have become depleted.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Per capita consumption would probably be the same as in 1939. Allowing for increase in population, total consumption might be around 21.4 million dollars and production for the domestic market about 21 million dollars. A 50-percent change in the duty would affect both consumption and production only slightly and no separate estimates of them are made under the various duty assumptions.

With the duty as in 1939 imports would probably have a foreign value of about \$225,000 (\$326,000, landed value). A 50-percent increase or decrease in the rate of duty would probably cause the foreign value of imports to decrease or increase by about \$25,000.

Per capita income 75 percent higher than in 1939.

Consumption in terms of quantity, might be 10 percent higher than with income as in 1939. Allowing also for an increase of about 10-15 percent in unit value, in line with an assumed rise in the general price level, total consumption would probably be about 26 million dollars. With the duty as in 1939, imports might have a landed value of about \$435,000 (\$300,000 foreign value) and production for the domestic market would then be valued at about 25.6 million dollars. Changes

in the duty by 50 percent would probably affect the foreign value of imports by no more than \$40,000.

Exports

United States exports of elastic fabrics after the war are likely to be in the neighborhood of 1 million dollars if per capita income is the same as in 1939, and might amount to 1.3 million dollars if income is 75 percent higher than in 1939.

HIDES AND SKINS

Tariff paragraph	Commodity	Rate of duty
1530(a)-----	Hides and skins of all kinds (except furs) raw or uncured, or dried, salted, or pickled: Cattle hides, calf skins, kip skins, and buffalo hides (except hides and skins of the India water buffalo imported to be used in the manufacture of rawhide articles).	10% ad val.
1678, 1691, and 1765.	All other hides and skins-----	Free.

NOTE.—The 10-percent rate, which is that fixed in the Tariff Act of 1930, was reduced to 5 percent ad valorem in the trade agreement with Argentina, effective November 15, 1941.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000)-----	1 140,000	4,224	1 136,000	1 47,066	1 183,000	Percent 1 26

¹ Estimated.
² Foreign value.

About 90-95 percent of world production of hides and skins is accounted for by four kinds: Cattle hides, calf and kip skins, goat and kid skins, and sheep and lamb skins. Other kinds of hides and skins include principally buffalo hides, horsehides, kangaroo and wallaby skins, deer and elk skins, pigskins, and reptile skins.

It is estimated that 85 percent of all hides and skins consumed in the United States are used in making leather for footwear. The remainder are used in making a wide variety of leathers, chief among which are leathers for gloves, garments, industrial belting, upholstery, harness and saddlery, luggage, handbags and pocketbooks, and small flat leather goods.

As they are byproducts of the livestock industry, the production of most hides and skins is governed principally by the demand for meat, dairy products, and wool rather than by the demand for hides and skins themselves. An increase in the demand for beef, for example, will increase the supply of cattle hides; on the other hand, an increase

In the demand for hides will have little effect on expanding the supply of beef but it will advance the price of hides. Although the over-all world supply of hides and skins remains relatively constant for periods of several years, the marketable supply varies to some extent with price because, with a strong demand and higher prices, hides and skins are obtained from more distant or marginal sources, and low-quality products, ordinarily discarded, enter the market.

The market for hides and skins is international in scope, since almost every country in the world is either an exporter or an importer or both. The chief importing nations are the United States, the United Kingdom, Germany, and France; the chief exporting countries include Argentina, Brazil, India, Australia, New Zealand, and several countries in Africa.¹

The United States is the world's largest producer of cattle hides, calf and kip skins, and sheep and lamb skins, but produces only negligible quantities of goat and kid skins and of most other kinds of hides and skins. Since domestic production of each major class is not sufficient to supply domestic requirements, it is necessary to import large quantities. Imports, on the average, range from about 20 percent of consumption for cattle hides to almost 100 percent for goat and kid skins. Because consumption varies substantially, and domestic production remains relatively constant over a period of years, imports, making up for the difference between consumption and production, vary strikingly from year to year. To a considerable extent different kinds of hides and skins can be used interchangeably in making leather.

During the war period, the cattle population in Europe has been somewhat depleted, and the decline will probably be not fully compensated in the immediate post-war period by the increased cattle population in the United States. Thus, immediately after the war, world production of cattle hides and calf and kip skins may be somewhat less than in 1939. Goat and kid skins, sheep and lamb skins, and other kinds will probably show no material change from pre-war levels of production, since these skins are mostly produced in areas that have not been directly affected by the war. In the later post-war period the world animal population will probably regain the approximate pre-war level and may possibly exceed it. While this increase will result in a somewhat greater production of hides and skins than before the war, it probably will not mean a corresponding increase in quantities available for export, because of the trend, accentuated during the war, toward the expansion of local tanning industries in countries having a surplus of hides and skins.

Reports indicate increases, during the past few years, of 10-25 percent in the tanning of hides and skins (principally cattle hides) in Argentina, Brazil, South Africa, Australia, India, Mexico, and Cuba, countries which in the past have been large exporters of raw hides and skins. Much of this increase has been the result of unusual wartime conditions, and the present level of leather production in these countries may not be maintained after the war. However, there may be a substantial permanent increase in leather production in these countries, if, as may be expected, improvement is made in the

¹ It should be noted that some of the principal importing nations also export substantial quantities of hides and skins and that some of the principal exporters also import substantial quantities. A large part of this trade is the result of surpluses or deficits of certain kinds and qualities in the various countries.

quality of leather they produce so that it will better meet the competition from leather produced in other countries. Thus, the supply of hides and skins, particularly of cattle hides, available for export even in the long-term post-war years might be less than in the immediate pre-war years, unless world production should be substantially higher than it was in 1939. Even with an increase in production of hides and skins in the countries having a surplus, the quantities available for export might increase only moderately.

Imports into the United States are reported under 31 statistical classifications. However, the four main groups included in the following tabulation account for the great bulk of total United States production and imports in 1939:

Description	Production ¹		Imports	
	Value	Percent of total	Value ²	Percent of total
	<i>1,000 dollars</i>		<i>1,000 dollars</i>	
Cattle hides.....	95,000	67.9	12,125	26.8
Calf and kip skins.....	23,000	16.4	4,615	9.8
Goat and kid skins.....	(³)	(³)	15,395	32.7
Sheep and lamb skins.....	20,000	14.8	9,908	21.1
All other hides and skins.....	2,000	1.4	5,013	10.6
Total.....	140,000	100.0	47,056	100.0

¹ Estimated.

² Foreign value.

³ Negligible.

Cattle hides, which are dutiable, constitute the most important group in domestic production and rank second in imports. They are used largely in making heavy leathers, such as sole and belting leathers, and are the only important kind of hide or skin that can be used as a raw material for these products. Substantial quantities of lighter and more flexible leathers, suitable for such products as shoe uppers, clothing, upholstery, and bags, cases and straps, are also made from cattle hides. Although the United States is the world's largest producer of cattle hides, production is not sufficient to meet requirements, necessitating the importation usually of about 20 percent of consumption. Besides supplying a quantitative deficiency, imports are particularly important in that they include large quantities of high-quality heavy hides from Argentina—the type from which heavy leathers can be made and of which the deficiency in domestic production is the greatest. The principal sources of imports of cattle hides have been Argentina, Brazil, and Canada; Argentina has supplied more than 50 percent of the total.

Calf and kip skins, also dutiable, are used almost entirely (about 90 percent) in making upper leather, principally for men's shoes. Imports usually supply about 20 percent of the total requirements. Northern and western European countries, New Zealand, and Canada have been the most important sources.

Goat and kid skins, duty-free, are practically all imported and constitute the most important group of imported hides and skins; they are used mostly in making upper leather for women's shoes, but important quantities go into leathers for shoe linings, gloves, and garments. Probably 90–95 percent are used for shoe upper and lining

leather. The United States is by far the world's largest consumer of goat and kid skins, absorbing about 60 percent of the world's exports. India has been the source of about 85 percent of United States imports, China about 15 percent, and Brazil and British West Africa about 10 percent each.

Sheep and lamb skins, duty-free, are used principally in the manufacture of leather for gloves and garments, about 60 percent of the total being consumed by tanners of these leathers. Approximately 30 percent are made into leather for shoe linings. Imports, supplying usually about 80 percent of United States consumption, have come principally from New Zealand and also in large quantity from Argentina, Australia, and South Africa.

All other hides and skins, all duty-free except certain buffalo hides, include a great variety, principally buffalo hides, horsehides, kangaroo and wallaby skins, deer and elk skins, pigskins, and reptile skins. They are used chiefly in making leathers for shoe uppers, gloves, garments, handbags, and luggage. Most of the United States supply of these skins has been obtained from foreign sources, chiefly India, Malaysia, Australia, Canada, and South and Central American countries.

POST-WAR SHORT TERM

Deferred civilian demand for leather footwear and other leather products and probable substantial exports of these products for relief and rehabilitation are likely to require the use of all the hides and skins which are available to this country from domestic production and importation. In view of higher prices that are likely to prevail, the increase in consumption in terms of value will probably be much greater than in terms of quantity.

Domestic production of cattle hides and calf and kip skins will probably be substantially greater than in 1939. The quantity of imports of such hides and skins will probably be no greater than at present, substantially below the level of 1939. Chief among the factors responsible for the decline will be increased tanning in countries having a surplus of these hides and skins, and increased imports of cattle hides by European countries because of the reduction of their cattle population. On the other hand, United States imports of goat and kid and sheep and lamb skins might be substantially larger than in 1939. World production of these skins has been affected but little by the war, and the tanning of them in countries having a surplus may not increase materially. The probably smaller foreign supplies of cattle hides and calf and kip skins available for export to the United States would also tend to increase the imports of goat and kid, and sheep and lamb skins. The total value of imports of hides and skins, therefore, may exceed slightly the value of imports in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

A 50-percent decrease or increase in rates of duty on cattle hides, calf and kip skins, and buffalo hides, dutiable at 10 percent under the Tariff Act of 1930 (since lowered to 5 percent) probably would not have, under either assumption as to national income, any great effect

on consumption, production or imports. All other hides and skins are duty-free.

Per capita income at 1939 level.

The per capita demand for leather footwear and other leather products would probably be about the same as in 1939, but the increase in population would result in an increase of about 10 percent in the demand. Supplies available to the United States, whether by domestic production or by importation, probably would be sufficient to meet these requirements. Consequently, the consumption of hides and skins might be about 10 percent greater than before the war and might amount, at pre-war prices, to about 200 million dollars.

Imports would probably supply about one-fourth of the consumption; the foreign value would probably be about 50 million dollars and the value of production for the domestic market would probably be about 150 million dollars. Both figures are based on the assumption of prices substantially the same as in 1939. Production of bovine hides and skins, which are dutiable, might amount to about 130 million dollars, and production of other kinds, which are duty-free, to about 20 million dollars. Dutiable imports would probably be about 20 million dollars, and duty-free imports, about 30 million dollars.

Per capita income 75 percent higher than in 1939.

Demand for shoes and other leather products is considerably affected by the level of national income. The limiting factor on consumption, with income at this level, might be the availability of supplies rather than demand. If world income should be maintained at high levels for a number of years, world consumption of meat and wool would become materially higher than at the income level of 1939, and a corresponding increase in world production of hides and skins would take place. The increase might, however, be insufficient to satisfy the strong demand for leather products, so that the prices of hides and skins might rise materially. It is doubtful whether the quantities available, either at home or abroad, for consumption in the United States would be more than 25-35 percent greater than before the war. Domestic and foreign prices of hides and skins, in turn, might be 25-35 percent higher than in 1939. On these assumptions, the value of consumption in the United States would probably be 310-335 million dollars. Imports would probably supply about the same proportion of consumption as with income at the 1939 level, namely, about one-fourth. If so, the value of imports would be 75-85 million dollars, and the value of United States production for the domestic market would be 225-260 million dollars.

Production of bovine hides and skins, which are dutiable, might have a value of 210-220 million dollars, and that of duty-free hides and skins, 15-40 million dollars. Dutiable imports would probably be 30-35 million dollars, and duty-free imports, 45-50 million dollars.

Exports

Exports of hides and skins have been small in comparison with production. In the short-term period there may be practically none, as the principal kinds that have been exported—cattle hides and calf and kip skins—will probably be in short supply in this country. In the long term, exports might again reach a level about the same as that in 1939.

LEATHER

Tariff paragraph: 1580 (b) (c) (d).

Commodity: Leather of all kinds.

Rate of duty: 7½ to 30% ad. val. *Equivalent ad valorem (1939):* 14%.

Note.—The rates fixed in the Tariff Act of 1930 ranged from 10 to 30 percent ad valorem. Reductions in duties were effected by Presidential proclamation under section 530, and pursuant to trade agreements with France, Canada, and the United Kingdom; most of the reductions were pursuant to the United Kingdom agreement, effective January 1, 1939.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	322,350	13,042	309,317	11,000	320,317	Percent 3.4
Persons employed (number).....	47,252					

¹ Not including the value of leather tanned for others, in contract factories, on commission. Receipts of contract tanneries for the tanning process in 1939 amounted to 17.7 million dollars, and the value of the leather thus produced is estimated at 40-50 million dollars.

² Estimated landed value; foreign value was \$9,564,000.

Leather may be classified principally into four main groups, namely: cattle-hide leather, calf and kip, goat and kid, sheep and lamb leathers. Leather may also be classified by use, such as for footwear; industrial belting; harness and saddlery; upholstery; bag, case, and strap; luggage and pocketbook; and glove and garment leathers. In the trade these two methods of classification are frequently combined. Approximately 85 percent of all leather consumed in the United States is used in the production of footwear.

The United States produced in 1939 about 35 percent of the total value of world production of leather and consumed about the same proportion; it is also one of the largest exporters of leather. The production of leather is limited by the available supply of hides and skins, which are, for the most part, byproducts of the meat and dairy industries. In pre-war years it was always necessary to supplement the domestic supply of hides and skins by imports, and this situation will undoubtedly continue in the future. Imports have usually furnished about 20 percent of United States requirements of cattle hides and calf and kip skins, about 50 percent of the requirements of sheep and lamb skins, and practically the entire supply of goat and kid skins. In addition to these, the supply of many miscellaneous classes of hides and skins, such as horse, deer, elk, kangaroo, reptile, and pig-skin, is largely imported.

There has been considerable wartime expansion of tanning facilities in certain foreign countries which are large producers of hides and skins, especially Argentina and Brazil. This development will reduce the exports of hides and skins from these countries in the post-war period. However, the new facilities are not sufficiently developed in the production of high-quality leathers to compete severely in the export leather trade with the long-established industries; therefore it seems likely that United States tanners will continue to be able to

obtained from abroad the supplies of hides necessary to make up the deficiency of domestic hides and skins.

Although the United States tanning industry usually produces more leather than is consumed in the country, substantial quantities of leather were imported in pre-war years, amounting in 1939 to 8.4 percent of domestic consumption in value. United States exports have also been fairly large and have usually exceeded imports in value, as they did in 1939.

United States imports generally are composed of leathers which, in quality, weight, or price, are different from the bulk of domestic leathers and of specialty leathers not produced at all in the United States. They have consisted of finished leathers and semifinished or rough-tanned leathers which require further processing by the domestic industry. Finished leathers have accounted for about 90 percent of the value of imports. United States exports have consisted mainly of varieties in which United States production has been large and for which United States tanners have gained a reputation not only for quality but for price.

Leathers imported into the United States are reported under 57 different import classifications, the most important of which are included in the following tabulation showing United States imports and production of comparable groups:

Import group	Production ¹		Imports	
	Value	Percent of total	Value ²	Percent of total
	1,000 dollars		1,000 dollars	
Sole, belting, wetting, and sole and belting offal leather.....	83,453	25.9	1,493	15.6
Cattle side upper leather and patent.....	72,536	22.5	563	5.2
Calf and kid upper and lining leather.....	30,487	11.8	4,187	43.2
Goat and kid upper and lining leather.....	34,561	10.7	430	4.5
Nonbovine glove and garment leather.....	17,839	5.5	473	4.2
Grained, embossed, or fancy bovine and nonbovine leather.....	5,934	2.2	349	2.0
Rough vegetable-tanned goat and sheep leather.....			284	3.0
Sheep and lamb lining leather.....	5,812	1.8	9	.1
All other.....	64,757	20.1	1,967	20.5
Total.....	322,356	100.0	9,564	100.0

¹ Does not include the value of production of leather produced in contract tanneries. For glove and garment leather the value of leather tanned on contract is very large and about equals the value produced in regular tanneries.

² Foreign value.

The rates of duty on various kinds of leather range from 7½ percent to 30 percent. All footwear leathers, except fancy, are covered by the lower duties ranging from 7½ percent to 15 percent, and non-bovine glove, garment, and fancy leathers are generally covered by the higher duties ranging from 20 percent to 30 percent. Most of the imported nonbovine leathers, other than shoe leather, are considered specialty leathers. More than 80 percent of United States imports of leather are dutiable at rates of 15 percent ad valorem or less. In estimating what imports might be under a 50-percent reduction or increase in duties, a number of factors other than duty must be considered, such as supplies of hides and skins both here and abroad, use of substitute materials, general economic conditions in foreign countries, and foreign demand for leather. Imports have come principally from the United Kingdom, France, and the Netherlands.

POST-WAR SHORT TERM

Domestic consumption of leather in the post-war short term will probably be substantially above the 1939 level. Increased demand for leather footwear and other manufactures of leather resulting largely from restricted wartime buying, demand of returning servicemen for civilian-type shoes, and high purchasing power of the people will be largely responsible for this increase. It appears that the supplies of hides and skins, domestic and foreign, will be sufficient to permit a higher volume of consumption. Imports of leather will presumably be materially smaller in value than before the war. European countries, which were important sources of United States imports of leather before the war, will not have fully recovered from the effects of the war by this time and imports from them will be less than normal. On the other hand, imports from Latin-American countries—especially Argentina and Brazil—may be much greater than in the pre-war period.

POST-WAR LONG TERM

Consumption, Production, and Imports

Imports and exports of leather were larger under the act of 1922 than under the higher duties introduced with the act of 1930. Changes in duty in this country and foreign countries were probably an important factor in bringing about the lower level of the country's foreign trade in leather in the thirties (with the higher duties, the prices of leathers in this country were less closely related to those in foreign markets). Consideration of the effects of changes in United States duties in the past, as well as analysis of the present trade in leather, suggests that the changes in duty here under consideration might not materially affect the volume of leather production in the United States, but might affect considerably the volume of the country's foreign trade in leather, both imports and exports. That is to say, with lower United States duties on leather it is to be anticipated that the movement of leathers out of, as well as into, this country would be greater than with higher duties. This result is especially to be expected when it is assumed that the lower duties here would be accompanied by reduced trade barriers in other countries.

This view as to the effects of different rates of duty has been taken into account in arriving at the estimates which follow.

Per capita income at 1939 level.

Under this assumption, the per capita consumption of leather would probably be about the same as in 1939, but the increase in population would result in an increase in the total quantity consumed and an increase of about 5-15 percent in the total value of consumption, which might be about 335-370 million dollars, assuming unit prices about the same as in 1939. Changes in duty would have little effect on the total value of consumption, since imports would not be large enough (for most classes of leather) to affect materially the price level of domestic leathers.

Duty as in 1939.—Per capita domestic consumption of leather would probably be about the same in quantity as in 1939, but in view of increased population there would probably be an increase in value

over 1939. The share of imports in consumption would probably be about the same as in 1939. Under these assumptions, the value of production for the domestic market would be 320-360 million dollars and the foreign value of imports would be 10-15 million dollars.

Duty reduced by 50 percent.—The share of imports in consumption would probably be somewhat greater than in 1939 (3.4 percent), perhaps becoming 5-6 percent of the total. Thus the value of production for domestic consumption would be 315-355 million dollars and the foreign value of imports would be 15-20 million dollars.

Duty increased by 50 percent.—With a 50-percent increase in duties, imports might be considerably less than in 1939, perhaps falling to 2½ or 3 percent of the consumption. Foreign countries, however, would make every effort to maintain their export trade in leather in the United States and would probably lower their prices to absorb at least a part of the duty increase. Under these conditions, the value of production for domestic consumption might be 325-365 million dollars, and the foreign value of imports might have a range as wide as 5-10 million dollars.

Per capita income 75 percent higher than in 1939.

It is unlikely that the consumption of leather would be affected to the same degree as that of many other commodities by the increase in national income, but, taking account of population growth, there might result an increase over 1939 of 20-40 percent in the quantity of consumption, the value of which, at prices probably 10-20 percent higher than in 1939, might amount to 430-510 million dollars.

Duty as in 1939.—It may be assumed that there would be a somewhat higher ratio of imports to consumption than in 1939. The reason for this difference is that at higher income levels there would be a relatively greater demand for foreign specialty leathers. The foreign value of imports at increased prices might total 20-25 million dollars. The value of production for domestic consumption would then be 405-490 million dollars.

Duty reduced by 50 percent.—The ratio of imports to consumption might be expected to increase still more above the 1939 ratio; if so, the foreign value of imports, at increased prices, might total 25-40 million dollars. The value of production for domestic consumption would be 390-485 million dollars.

Duty increased by 50 percent.—Taking into account the increased population and the probable willingness of foreign producers to reduce prices in order to remain in the United States market, imports would probably be somewhat greater than in 1939. The foreign value of imports, at increased prices, might be 10-15 million dollars, and the value of domestic production for consumption, 415-500 million dollars.

Exports

United States exports of leather have consisted of certain specialty leathers and leathers which, because of large-scale production, have a competitive advantage in foreign markets. Over a long period, the value of exports has usually exceeded that of imports by a small margin, 1939 representing a fairly normal pre-war year. In 1939 exports were valued at 13 million dollars, or about 4 percent of domestic production. In the post-war short term, domestic exports of leather, largely for relief and rehabilitation, may approximate the 1939 level.

In the post-war long term, the value of United States exports will probably be below the 1939 level if income is low and duties high and perhaps will total 10-12 million dollars. On the other hand, if the world income level is high and the world level of duties is low, exports may well exceed the 1939 level by 50 percent and total 18-20 million dollars. Under the latter conditions, foreign countries would be in a very favorable position to purchase the special grades and qualities of leather produced in the United States which are not available in sufficient quantities in the home market.

Employment

The changes in duties outlined above would probably not have sufficient effect on domestic employment to cause any substantial increase or decrease in the number of employees. Under the maximum production indicated under the high-income level, the number of employees might be in the neighborhood of 55,000 as compared with 47,000 in 1939.

FOOTWEAR (EXCEPT RUBBER)

Tariff paragraph: 1530 (e).

Commodity: Boots, shoes, slippers, and other footwear (except fabric footwear with rubber soles and all-rubber footwear).

Rate of duty: Leather footwear, 10 to 30% ad val.; leather-soled footwear with uppers in chief value of textiles, 35% ad val. *Equivalent ad valorem (1939):* 21%.

NOTE.—The rates fixed by the Tariff Act of 1930 were 20 percent ad valorem on leather footwear and 35 percent on leather-soled footwear with fabric uppers. The 20-percent rate was increased to 30 percent on McKay-sewed shoes and decreased to 10 percent on turned shoes, effective January 1, 1932, by Presidential proclamation under section 336 of the Tariff Act. Pursuant to the Czechoslovak trade agreement, effective from April 16, 1938, until suspended on April 23, 1939, the duty on McKay-sewed shoes was reduced to 20 percent and the duty on footwear with molded soles laced to uppers was reduced to 10 percent. A reduced rate of 25 percent was also in effect during this period on leather-soled footwear with fabric uppers. Reductions in duties were also made in or before 1939 on other specified types of leather shoes, pursuant to trade agreements with United Kingdom and Canada, the rates of which are still in effect. The 1943 agreement with Mexico reduced the rates on certain special types.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export ¹	For domestic market			
Quantity (1,000 pairs).....	435,258	3,066	432,192	2,679	434,871	Percent 0.62
Value (\$1,000).....	732,808	5,346	727,462	2,571		
Unit value (per pair).....	\$1.68	\$1.74	\$1.68	\$0.96		
Persons employed (number).....	218,028					

¹ Does not include footwear classified as "discontinued models," for which the number of pairs are not reported but which is valued at \$468,280.

² Foreign value; does not include 2.4 million pairs of footwear with a foreign value of \$167,288, imported under class 0369.9, consisting chiefly of low-priced slippers and sandals with uppers in chief value of straw or textiles and with soles of materials other than leather or rubber (averaging 7 cents a pair, foreign value), imported principally from Japan, China, and Hong Kong.

The total imports of the footwear here under consideration for 1939 were about 26 percent below the average for the 3-year period 1936-38. This decrease was due principally to the rapid decline in imports from Czechoslovakia after Bohemia and Moravia were brought under German control in the spring of 1939. Even in 1939, however, Czechoslovakia was the predominant source of imports, particularly for the low-priced shoes for women and misses. Because the value of domestic production is available for 1939, a normal pre-war year, the analysis of the composition of domestic production and imports has been made on the basis of that year. In the following discussion of the future of the trade, however, consideration has been given to the probability that if imports from Czechoslovakia had continued throughout 1939, total imports would have reached 4 million pairs, with a foreign value of about 3.7 million dollars.

This section covers all types of footwear except fabric footwear with rubber soles, all-rubber footwear, and slippers and sandals with uppers of straw or textiles and soles of materials other than leather or rubber. The principal types covered have either uppers or soles, or both, of leather and include boots, shoes, moccasins, and slippers. Such footwear is also classified in the statistics of production and trade on the basis of age and sex of the wearer, namely, men's; youths' and boys'; women's and misses'; children's; and infants'. A third basis of classification is by the method used in attaching the soles to the uppers. The three basic methods are sewing, nailing, and cementing. The most important variants of the sewing method are welt, McKay, stitch-down, and turn; in the cement process the sole is attached under controlled pressure by a machine.

Footwear of all the types under consideration is produced in very large quantities in the United States. This country accounts for about 40 percent of the world output. Shoe manufacturing is one of the most important industries in the United States. In 1939 the industry ranked twelfth among the industrial classifications of the census in value of products, twelfth in value added by manufacture, and fifth in the number of wage earners employed. Changes in duties would have little effect on the total quantity or value of consumption, since, even with a 50-percent reduction in duty, imports would not be large enough (for most classes of footwear) in relation to the large domestic production to affect materially the price level of domestic footwear.

The trend of footwear consumption and production in the United States moves generally in the same direction as the trend of national income, the value of production in recent years amounting to about 1 percent of national income. Future production of leather footwear may possibly be limited by the supply of leather, which in turn is dependent on the available supply of hides and skins, produced mainly as byproducts of the meat and wool industries. A large post-war increase in demand for footwear would probably require the use of increased quantities of substitutes for leather, particularly as bottom stock for boots and shoes. Rubber for soles and heels; cork for inner soles; and fabrics, felts, and fibers for shoe uppers have been used successfully for some time. A new vinyl plastic which has been found very satisfactory for outer soles will become available in large quantities after wartime restrictions have been removed.

The imports of leather footwear in 1939 are shown by main types in the following tabulation, together with United States production of comparable groups:

Type	Production		Imports ¹	
	Value	Percent of total	Value ²	Percent of total
Boots and shoes:	<i>1,000 dollars</i>		<i>1,000 dollars</i>	
Men's.....	230,720	31.5	404	19.2
Youths' and boys'.....	24,778	3.4	2	.1
Women's, misses', and children's.....	335,417	52.5	1,780	89.3
Infants.....	17,850	2.4	2	.1
Slippers and moccasins.....	34,745	4.7	30	1.1
Boots, shoes, and other footwear with uppers in chief value of textiles, leather-soled.....	24,000	3.3	263	10.3
All other ³	16,498	2.1	-----	-----
Total.....	732,808	100.0	2,571	100.0

¹ Does not include footwear amounting to 2.4 million pairs with a foreign value of \$167,000 entered under class 0899.9. This footwear is extremely low in unit value and consists chiefly of slippers and sandals with uppers in chief value of straw or textiles, and with soles of materials other than leather or rubber. There is no domestic production of footwear similar to imports under this class.

² Foreign value.

³ Includes athletic shoes with a value of \$3,890,000; beach sandals, \$3,632,000; and overgaiters, puttees, and slippers valued at \$992,000.

Imports are reported under thirty different classifications. The bulk of the import trade in footwear, however, may be grouped into two main classes: (1) High- and medium-quality shoes, which in 1939 accounted for only about 5 percent of the number of pairs of shoes imported but for about one-fourth of the total on a value basis; and (2) low-priced footwear, which accounted for about 95 percent of the total on the basis of quantity and almost three-fourths on the basis of value.

Some of the higher quality imported shoes are of welt construction; these are, for the most part, men's shoes. In this trade the United Kingdom predominates, though there are small imports of similar character from several other sources. Also in the higher-quality imports are included considerable numbers of women's shoes. Most of these are with cemented soles and come chiefly from Switzerland. Additional small amounts of high-quality turned and McKay-sewed women's shoes have been imported from Italy, France, and some other countries. Some of these imports have had a foreign value per pair in excess of \$10, but those with a value of \$5 to \$7 predominate in the men's shoes, and those imports of women's shoes from Switzerland have had foreign values of \$3 to \$4 per pair. Imported high-quality footwear sells in the United States market largely on account of style and prestige.

The low-priced imported footwear before the war consisted largely of women's shoes with leather uppers and with cemented or McKay-sewed leather soles. Czechoslovakia was by far the most important source of such imports, but the Netherlands, Germany, and several other countries supplied some imports of this general character. Other types of low-priced imported shoes consisted of huaraches (a special type of footwear produced in Mexico); heavy work shoes produced in Mexico and Czechoslovakia; and leather-soled shoes with fabric uppers which were supplied mainly from Czechoslovakia, China, and Italy, but also from the United Kingdom and a number of other coun-

tries. The great bulk of the imported low-priced shoes had a foreign value per pair of less than \$1.

It is chiefly in the cheaper footwear that the rates of duty on imports are of importance in influencing the volume of imports. The duty on the bulk of low-priced footwear is 20 percent. Changes in that rate by 50 percent might affect the volume of imports to a considerable extent.

The rate of duty applicable to most of the imports of men's higher-grade shoes is 10 percent ad valorem, and on most of the imports of women's and misses' high-grade shoes, 20 percent. These duties probably do not restrict imports to any considerable degree, and it seems likely that the volume of imports would not be substantially affected by 50-percent changes in duty in either direction. An increase of the duty would not increase the prices sufficiently to reduce appreciably the prestige and special demands. A decrease in duty would probably have somewhat greater influence in encouraging imports because it would bring the prices of the imported high-grade shoes within the buying power of more people.

POST-WAR SHORT TERM

Domestic consumption of footwear will probably increase greatly over 1939. Because of wartime curtailment of domestic production of footwear for civilian use and because of shoe rationing, the inventories of leather shoes in the hands of jobbers and retailers and the supply of shoes held by consumers will be extremely low at the end of the war. Accumulated purchasing power in the United States and the demand by civilians and by men and women discharged from the military services will probably cause a sharp increase in consumption of footwear wholly or partly of leather.

In the first 2 or 3 years after the war, imports of women's and misses' shoes from Czechoslovakia will probably be considerably below the average annual pre-war level, both because of the deficiency in shoes in that country and neighboring countries, and because of impaired production facilities. Imports from the United Kingdom and Switzerland may virtually equal the 1939 level. On the other hand, imports from Mexico of leather sandals (huaraches) and heavy work shoes will probably greatly exceed the 1939 level; also, imports of women's shoes from Argentina, which were negligible in 1939, will probably be much greater than in that year. The value of imports of all types of footwear combined will probably be somewhat greater than in 1939. However, because of the expected expansion in the value of domestic production, imports will probably form a smaller part of consumption than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

During World War II, because of the shortage of leather and the requirements of the military, the production of all-leather shoes for civilian use has been reduced and consumer buying has been limited by rationing. These circumstances have resulted in a very rapid increase in the production of women's footwear having uppers and soles of materials other than leather, most of which could be purchased by the consumer without a ration stamp.

It seems probable, however, that over the long-term period the production of nonleather shoes will decline sharply, and that the several kinds of all- or part-leather footwear will continue to maintain about the same general proportion in consumption, production, and imports as in 1939. A 50-percent reduction in duty would probably reduce only slightly the average domestic shoe prices for all types and grades combined and therefore would not materially affect total consumption of shoes. Such duty reduction however, may, materially affect not only the prices of low-priced shoes for women but also the imports, for imports consist chiefly of this type of shoes.

Per capita income at 1939 level.

The per capita consumption of the kinds of footwear discussed in this report would probably be about the same as in 1939, but the increase in population would result in an increase of about 10 percent in total consumption, making the quantity about 480 million pairs.

Duty as in 1939.—Even under the same duty as in 1939, imports would probably be higher than in 1939 because imports from Czechoslovakia were shut off during the latter part of that year as a result of unsettled conditions. With the Czechoslovak industry again operating normally, imports might amount to 4–5 million pairs, with a foreign value of 4–5 million dollars. If so, production for the domestic market might amount to about 475 million pairs, with a value of nearly 800 million dollars.

Duty reduced by 50 percent.—Such reduction in duty would probably cause a rather substantial increase in imports, especially of medium- and low-priced shoes for women now subject to the 20- and 30-percent rates. The share of imports in domestic consumption might become as much as 2 percent. Imports might thus be about 10 million pairs, with a foreign value of about 10 million dollars. Production for the domestic market might amount to about 470 million pairs, with a value of about 790 million dollars.

Duty increased by 50 percent.—Imports would probably be considerably smaller than with no change in rate. They might be between 3 and 4 million pairs with a foreign value of, say, 3–4 million dollars. Production for the domestic market in both quantity and value would then be slightly greater than with no change in duty.

Per capita income 75 percent higher than in 1939.

Consumption might be as much as 35 percent greater than with income as in 1939, or about 650 million pairs, though the proportion of all-leather shoes might decline because of limitations on the quantity of hides and skins available from domestic production and imports.

Duty as in 1939.—The ratio of imports to consumption would probably be somewhat greater than that based on income as in 1939, for the reason that with higher purchasing power there would be an increased demand in the United States for high-grade foreign shoes, especially those from the United Kingdom and Switzerland. If the ratio should increase to about 1½ percent, the volume of imports would amount to about 9–10 million pairs, the foreign value of which, at the higher prices to be expected, would be about 10–11 million dollars. Production for the domestic market might be about 640 million pairs, with a value at increased prices of about 1,180 million dollars.

Duty reduced by 50 percent.—A reduction in duty would undoubtedly stimulate imports. The ratio of imports to consumption might increase to about 2½ percent; imports might be in the neighborhood of 15–16 million pairs, with a foreign value of imports, at the higher prices to be expected, of about 16–17 million dollars. Production for the domestic market would then be about 634 million pairs with a value of about 1,170 million dollars.

Duty increased by 50 percent.—Even at such rates of duty, as many as 7–8 million pairs would probably be imported, with a foreign value of about 8–9 million dollars. Production for the domestic market might then amount to about 642 million pairs with a value of about 1,190 million dollars.

Summary of estimates.

The foregoing estimates of consumption, imports, and production are summarized in tables 1 and 2.

TABLE 1.—Footwear (except rubber); estimated post-war production, imports, and consumption, under the assumptions of Senate Resolution 341

(Millions of pairs)

Period, income level, and tariff treatment	Production for domestic market	Imports	Consumption ¹
1939.....	432	3	435
Post-war long term:			
Per capita income as in 1939:			
Duty as in 1939.....	475	4-5	480
Duty reduced by 50 percent.....	470	8-10	480
Duty increased by 50 percent.....	476	3-4	480
Per capita income 75 percent higher than in 1929:			
Duty as in 1939.....	640	9-10	650
Duty reduced by 50 percent.....	634	15-16	650
Duty increased by 50 percent.....	642	7-8	650

¹ Consumption would be affected to some extent by the assumed level of the duty, but probably not enough to warrant differentiation in the figures given in this column.

TABLE 2.—Footwear (except rubber); summary of estimated post-war production and imports under the assumptions of Senate Resolution 341

Period, income level, and tariff treatment	Production for domestic market			Imports		
	Quantity	Unit value	Value	Quantity	Unit value	Value
	Million pairs	Per pair	Million dollars	Million pairs	Per pair	Million dollars
1939.....	432	\$1.68	727	3	\$0.96	3
Post-war long term:						
Per capita income as in 1939:						
Duty as in 1939.....	475	1.68	798	4-5	.96	4-5
Duty reduced by 50 percent.....	470	1.68	790	8-10	.96	8-10
Duty increased by 50 percent.....	476	1.68	800	3-4	.96	3-4
Per capita income 75 percent higher than in 1929:						
Duty as in 1939.....	640	1.85	1,180	9-10	1.08	10-11
Duty reduced by 50 percent.....	634	1.85	1,170	15-16	1.08	16-17
Duty increased by 50 percent.....	642	1.85	1,190	7-8	1.08	8-9

Exports

United States exports of footwear (except rubber) have consisted principally of women's and misses' and men's leather boots and shoes. In 1939 the value of domestic exports was 5.3 million dollars, or 0.72 percent of production. Exports of women's and misses' shoes were valued at 2.8 million dollars and men's shoes at 1.9 million or about 52 percent and 35 percent, respectively, of the total value of all classes of exports combined. In the years immediately following the war, domestic exports of footwear, principally for relief and rehabilitation, will probably equal or slightly exceed the 1939 level. In the post-war long-term period, the value of exports will probably be below the 1939 level if income in foreign countries is no higher than in 1939 and if duties and other trade barriers are as high as in the immediate pre-war period. By then most European countries will probably have returned to normal footwear production, and some factories established during the war in foreign countries may continue to supply home markets and even to export footwear. On the other hand, if the world income level is much higher and the world level of duties and other trade barriers is much lower than in 1939, foreign countries would be in a favorable position to purchase footwear of certain grades and qualities of which they do not produce enough for their own requirements. United States exports might, however, only slightly exceed the 1939 level, and, with higher unit prices, perhaps have a value of about 6 million dollars.

Employment

On the basis of the above estimated production of footwear in the United States in the long-term period, employment would probably be 235,000-320,000 persons, depending chiefly on the assumed income level.

RUBBER-SOLED FOOTWEAR WITH FABRIC UPPERS

Tariff paragraph: 1530 (e).

Commodity: Rubber-soled footwear with fabric uppers.

Rate of duty: 35%, based on the American selling price of similar domestic articles.

NOTE.—The rate fixed in the Tariff Act of 1930 was 35 percent ad valorem on the basis of foreign value. The ad valorem basis was changed to American selling price of a similar domestic article, effective March 3, 1933, pursuant to Presidential proclamation under section 336. In the absence of a similar domestic article, the duty is based on foreign value.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pairs).....	44,076	1,627	43,449	863	44,312	Percent ²
Value (\$1,000).....	28,097	422	27,675	2,152		
Unit value (per pair).....	\$0.64	\$0.67	\$0.64	\$0.18		

¹ Does not include small quantities of shoes with waterproof fabric uppers.

² The reported values of imports, when compared with reported quantities indicate that most, if not all, of the statistics of imports reflect foreign values. Statistics are not available to indicate the percentage of imports dutiable on the basis of American selling price.

Rubber-soled footwear with fabric uppers accounts for about 35 percent of all the rubber footwear produced in the United States, for about 97 percent of imports, and for 57 percent of exports. The principal kinds of fabric-top, rubber-soled footwear produced in the United States are for basketball, tennis, and other sports. Imports are generally of the same types as the domestic product but are usually inferior in quality even to the cheapest grades produced in the United States. Japan was the principal source of imports in 1939, furnishing about 95 percent of the total. The remainder came principally from Germany. In earlier years Czechoslovakia was an important source of imports. During the war, the production of rubber-soled footwear has increased substantially in Brazil and other Latin-American countries. In 1933, the year in which the basis for the assessment of duties was changed from foreign value to American selling price, imports amounted to approximately 10 percent of domestic consumption.

POST-WAR SHORT TERM

There will be a large postponed demand for rubber-soled footwear at the end of the war. For a short period the supply of rubber may be insufficient to permit the full use of all manufacturing facilities, but production will probably soon exceed the pre-war level. Synthetic rubber will probably be used in this type of footwear. Imports are quite likely to be lower. The principal foreign producing countries will be engaged in rehabilitating their civilian population and most of the footwear produced will be needed for this purpose.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

With an increase in population and in the popularity of sports in which rubber-soled footwear is used, domestic consumption might amount to as much as 50 million pairs annually, or about one-eighth more than in 1939.

Duty as in 1939.—Imports might supply about the same proportion of total consumption as in 1939, about 2 percent, and amount to about 1 million pairs. If the unit value should be about the same as in 1939, the value of imports would be about \$180,000. Production for the domestic market under these conditions would be in the neighborhood of 49 million pairs, valued (at the pre-war average price) at about 31.4 million dollars.

Duty reduced by 50 percent.—Imports, especially those of low-priced footwear, would probably increase substantially under a reduced duty. The ratio of imports to consumption might become as high as 4 percent, or about 2 million pairs with a value of about \$350,000. Production for the domestic market would probably be in the neighborhood of 48 million pairs, valued at about 30.7 million dollars.

Duty increased by 50 percent.—An increase in duty would probably reduce imports to about 1 percent of consumption, or to about 500,000 pairs, with a value of less than \$100,000. Domestic production would thus be only slightly less than 50 million pairs, valued at about 32 million dollars.

Per capita income 75 percent higher than in 1939.

Under a higher national income consumption might be as much as 40 percent greater than with income at the 1939 level, or, say, about 70 million pairs. An increase in price about equal to the rise in the general price level under a higher national income would probably occur.

Duty as in 1939.—The ratio of imports to consumption would probably be somewhat higher than in 1939. Imports might amount to about 1½ million pairs which, at increased prices, would have a value of about \$300,000. Production for the domestic market would probably amount to about 68.5 million pairs, valued in the neighborhood of 52 million dollars.

Duty reduced by 50 percent.—Imports might supply as much as 5 percent of the consumption and amount to about 3½ million pairs with a foreign value, at increased prices, of about \$700,000. Production for the domestic market would probably amount to about 66.5 million pairs, valued at, say, 50 million dollars.

Duty increased by 50 percent.—Assuming a ratio to consumption of about 1 percent, imports might be in the neighborhood of 700,000 pairs, with a foreign value of approximately \$200,000. Production for the domestic market would probably be in the neighborhood of 69.3 million pairs, valued at about 52.5 million dollars.

Exports

The United States had a fairly substantial export market before the war and will probably have one in the future. During the immediate post-war years foreign markets are likely to absorb all that can be spared from the domestic production of rubber-soled shoes, for which there will be a long-postponed domestic demand. In the longer term it is possible that the United States will be the world's largest producer of special-purpose rubber. Exports of articles made therefrom, including rubber footwear, may be large.

Employment

Employment in the domestic industry producing all-rubber and rubber-soled footwear in 1939 was about 18,000, of which 15,000 were wage earners. It is not possible to estimate the number of people engaged in the production of rubber-soled footwear only.

LEATHER LUGGAGE, HANDBAGS, BILFOLDS, AND RELATED ARTICLES

Tariff paragraph: 1531.

Commodity: Leather luggage and related articles, handbags, bilfolds, dog equipment, straps and strops, belts and buckles, wearing apparel and manufactures of leather, rawhide, or parchment, n. s. p. f.

Rate of duty: 17½%, 20%, 25%, and 35% ad val. *Equivalent ad valorem (1939):* 27%.

NOTE.—The rates fixed in the Tariff Act of 1930 were 35 and 50 percent ad valorem, the latter rate applying only to fitted traveling, sewing, manicure, and similar sets. Reduced rates ranging from 17½ percent to 35 percent were made effective on all the items in this category except flat goods not made of reptile leather, pursuant to the trade agreement with the United Kingdom, effective January 1, 1939. Certain subsequent reductions were made in the agreement with Argentina in 1941.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	\$ 67,180	1,878	65,277	\$ 1,200	1 00,477	Percent 1.8
Persons employed (number).....	1 20,000					

1 Estimated.
 2 Estimated landed value; foreign value was \$897,000.

This section deals with practically all manufactures of leather, except footwear, gloves, belting for industrial uses, saddlery, harness and whips, and sport articles.

The United States is the leading producer and consumer of the leather goods provided for in paragraph 1531 and covered by this statement. Substitute materials, such as fabrics or plastics, are used for luggage and handbags when the supply of leather is short or prices too high.

A rapid wartime expansion of production of handbags and small leather goods has occurred in Latin-American countries, especially Argentina, and imports into the United States from those countries have increased greatly. Imports from Europe have virtually stopped. Domestic manufacturers have not been permitted during the war to use any of the strategic leathers for these kinds of products.

United States imports usually consist of luggage or handbags which differ in quality or price from the bulk of domestic production; they also include a number of specialty articles not produced in the United States. Leather manufactures here under consideration are included in the following tabulation, which shows United States imports and production in 1939:

Description	Production		Imports	
	Value	Percent of total	Value 1	Percent of total
Luggage and related articles.....	1,000 dollars \$ 18,000	26.7	1,000 dollars 289	32.3
Coin purses, change purses, billfolds, bill cases, bill rolls, bill purses, bank-note cases, currency cases, pass cases, passport cases, letter cases, and similar flat leather goods.....	\$ 12,000	17.9	190	21.9
Women's and children's handbags or pocketbooks.....	27,856	41.5	153	17.1
Other manufactures of leather.....	9,284	13.9	265	29.8
Total.....	\$ 67,180	100.0	897	100.0

1 Foreign value.
 2 Estimated.
 3 Includes leather dog equipment with a foreign value of \$10,000; leather straps and strops, \$42,000; leather belts and buckles to be worn on the person, \$28,000; leather wearing apparel, not otherwise specified, \$12,000; and miscellaneous manufactures of leather, rawhide, or parchment, \$101,000.

Imports of luggage and related articles of leather have been supplied principally by the United Kingdom; most of these consist of expensive high-quality luggage. A wide variety of leather coin purses, billfolds, cases, and flat leather goods is also imported principally from the United Kingdom. Women's and children's leather handbags are imported chiefly from France and the United Kingdom. Such leather goods from the United Kingdom and France have prestige value in the United States market. During World War II, Argentina has become the principal source of imports of handbags, especially reptile leather bags, on which the rate of duty was reduced to 17½ percent (effective November 15, 1941).

For the many other leather articles imported under paragraph 1531, the United Kingdom, Italy, and France, in the order mentioned, were the principal sources of United States imports in 1939.

POST-WAR SHORT TERM

Domestic consumption of the leather articles under consideration will probably be much above the 1939 level, by reason of restricted production during the war, together with high purchasing power. Since April 1, 1944, there has been a 20-percent luxury tax on sales of most of these leather articles. It appears that the supplies of leather will be sufficient to permit a higher volume of production after the war. European countries, which were the principal pre-war sources of imports will not have fully recovered from the effects of the war in the short-term period; therefore imports from these sources will probably be somewhat less than in 1939. On the other hand, imports from Latin-American countries, especially handbags, purses, and small leather goods from Argentina, Brazil, Cuba, and Mexico, will probably continue to be much larger than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The per capita consumption of leather luggage, handbags, and related leather articles would probably be about the same as in 1939, but the increase in population would result in an increase of about 10 percent in total value of consumption; in round figures it might reach 75 million dollars.

Consumption would be somewhat affected by a 50-percent change in the rates of duty in either direction, but hardly enough to warrant making separate estimates of consumption under the different duty assumptions. For convenience, the estimates of production and imports have been made on the assumption that any change in imports would be accompanied by a corresponding change in domestic production in the opposite direction. As a matter of fact, many of the imported goods are specialties; the increase or decrease in sales of these would not necessarily have much effect upon domestic production.

Duty as in 1939.—Domestic production and imports would probably be in about the same relation as in 1939. Taking into account the increase in population, the value of production for the domestic

market would be about 74 million dollars and the foreign value of imports would be about 1 million dollars.

Duty reduced by 50 percent.—The share of imports in consumption might be twice as great as with duties as in 1939. The value of domestic production might be about 73 million dollars and the foreign value of imports might be about 2 million dollars.

Duty increased by 50 percent.—It would be difficult for foreign countries to maintain their normal export trade to the United States without lowering their prices to absorb at least a part of the duty increase. Imports might be somewhat less than in 1939, say, \$750,000. Under these conditions, the value of production for the domestic market might be slightly more than 74 million dollars.

Per capita income 75 percent higher than in 1939.

The value of consumption of leather luggage, handbags, billfolds, and similar articles would probably be 50 percent or more greater than with income as in 1939. Part of this increase would allow for a price increase about equal to the rise in the general price level under a higher national income. The value of consumption might amount to about 115 million dollars.

Duty as in 1939.—It may be assumed that there would be a higher ratio of imports to consumption than with income as in 1939. At higher income levels there would be a relatively greater demand for high-grade foreign leather luggage, handbags, and specialty articles made of leather. The foreign value of imports, at increased prices, might amount to about 3 million dollars and the value of production for the domestic market would be in the neighborhood of 112 million dollars.

Duty reduced by 50 percent.—The foreign value of imports might amount to 5 million dollars, and the value of production for the domestic market to about 110 million dollars.

Duty increased by 50 percent.—The foreign value of imports might be about 2 million dollars and the value of production for the domestic market about 113 million dollars.

Exports

United States exports of the leather manufactures herein considered are reported under six classifications. In 1939 the value of exports of these leather articles was \$1,873,000, or about 2.8 percent of the estimated value of domestic production. The principal groups of leather articles exported were women's handbags and pocketbooks, \$393,000; card cases, purses, wallets, \$32,000; luggage and related articles, \$220,000; belts to be worn on the person, \$472,000; leather wearing apparel, \$39,000; and other leather manufactures, \$608,000.

In general, exports are of lower quality and price than imported articles. In the post-war short term domestic exports may approximate the 1939 level, with Canada probably remaining the principal export market. In the post-war long term, the value of exports will probably be somewhat below the 1939 level if world levels of income and trade barriers are as in 1939—possibly in the neighborhood of 1.5 million dollars. On the other hand, if the world income level is high and the trade barriers in foreign markets are reduced, the value of exports may be about 60 percent above the 1939 level and total about 3 million dollars.

Employment

The changes in duties outlined above would probably not have sufficient effect upon domestic production to cause any substantial increase or decrease in the number of employees. Under the maximum production indicated under the high income level, the number of employees might be in the neighborhood of 25,000 compared with 20,000 (estimated) in 1939.

WOMEN'S AND CHILDREN'S LEATHER GLOVES

Tariff paragraph: 1532 (a).

Commodity: Women's and children's dress and street gloves of leather.

Rates of duty: Various.

Equivalent ad valorem (1939): 35% to 75% (average, 63%).

NOTE.—The rate fixed in the Tariff Act of 1930 on women's and children's leather gloves is \$5.50 per dozen pairs, with additional cumulative duties when more than 12 inches in length, when machine-seamed, when hand-seamed, when lined, or when trimmed with fur. All these gloves were subject to a minimum rate of 50 percent ad valorem. The rates were reduced on gloves lined or trimmed with fur, pursuant to the trade agreement with the United Kingdom, effective January 1, 1939, and on those not lined or trimmed with fur pursuant to the agreements with France (hand-seamed gloves only) and Czechoslovakia (machine-seamed gloves only), effective June 15, 1938, and April 16, 1938, respectively. The reduced rates made effective pursuant to the United Kingdom and French agreements remain in force; those made effective pursuant to the Czechoslovak agreement were terminated April 22, 1939, resulting in the restoration of the original tariff act rates.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pairs).....	8,713	130	8,583	3,182	11,765	Percent
Value (\$1,000).....	10,560	88	10,472	12,682		27
Unit value (per pair).....	\$1.21	\$0.68	\$1.22	\$0.84		
Persons employed (number).....	5,000					

¹ Foreign value.

² Estimated.

The quantity and value of imports of women's and children's leather dress gloves in 1939 were about 36 and 38 percent, respectively, below the average imports for the more representative 3-year period 1936-38 (quantity 5 million pairs valued at 4.3 million dollars). This decline was due principally to the cessation of imports from Czechoslovakia during May to December 1939. In the discussion of the future of the trade, consideration is given to the probability that, if imports from Czechoslovakia had continued throughout 1939, total imports would have been substantially above those given in the foregoing tabulation.

Leather gloves for women and children are of two general types, those used for indoor or formal wear and those used for street and sport wear.

The leather glove industry in the United States is centered largely in the State of New York, and more particularly in Fulton County, where about 66 percent of the Nation's 233 factories are located. In 1939, over 90 percent of the total domestic production of women's and children's leather dress gloves (on both a quantity and value basis)

were manufactured in the State of New York. Other centers of production are Illinois, Wisconsin, and California.

Women's and children's unlined leather gloves for dress and street wear, which constitute the bulk of domestic production of women's and children's leather gloves and which account for practically all the imports, include a wide variety of styles, grades, and qualities, which may be broadly classified as either fancy or plain. Sport gloves are made of heavier leather than street gloves, and are generally triple-sewn. The gloves for formal wear are made of finer grades of glacé kid, lamb, and suede leather, in types known as mousquetaires of various lengths and also short novelty gloves.

Glove leathers are produced, in large volume, by domestic tanners, chiefly from imported raw skins. Imports of glove leathers are small in comparison with domestic consumption. During the year 1944 the volume of domestic production of women's and children's leather dress gloves for civilian use declined substantially. Leather glove requirements for the military, the difficulty in securing a sufficient quantity of imported skins, the stringency of ocean shipping, and the shortage of manpower in the glove factories were the principal reasons for the decline.

There has been considerable wartime expansion in the production of women's and children's leather dress gloves in Argentina. A marked improvement in the quality and style of the Argentine product has also occurred, largely because of the influx of skilled refugee labor from European countries. Thus, with the great reduction of United States imports from Europe during the war, Argentina has become an important source.

A wide variety of different styles of women's and children's leather dress gloves—fancy or plain, unlined or lined, machine- and hand-seamed—are imported under 51 import classifications. However, women's and children's unlined leather gloves, not over 12 inches in length, accounted for about 90 percent of the total quantity and value of 1939 imports. These gloves, if machine-seamed or overseamed, and machine-seamed not overseamed, were dutiable at \$5.50 and \$6.50 per dozen pairs, respectively, but at not less than 50 percent ad valorem. If seamed by hand, the gloves were dutiable at \$7.50 per dozen pairs, but not less than 35 percent ad valorem (reduced rate of French trade agreement, effective June 15, 1936).

Although differing somewhat in technical detail, domestic and imported leather gloves for women and children are competitive. Imported gloves are mainly of brush-dyed lamb and kid leathers, while domestic gloves are produced chiefly of dip-dyed cape and pig leathers. Both domestic and imported gloves are sold at definite retail price levels. In most instances the imported gloves which are sold in any given retail-price line contain more hand labor and are superior in design to the domestic. The imported fancy gloves are generally more elaborately embellished than fancy gloves produced in the United States. In general, however, domestic gloves are more durable than foreign gloves.

POST-WAR SHORT TERM

Consumption will probably be substantially above the 1939 level. Increased consumer demand, resulting largely from restricted wartime production, low stocks in the hands of retailers and consumers,

and the probable high purchasing power of the people will be largely responsible for this increase. It is probable that the supplies of glove leathers, either produced in the United States from domestic or foreign skins or imported, will be sufficient to permit a substantial increase in production of leather gloves in this country.

Imports may be about the same as in 1939. Because glove production in France, Czechoslovakia, and Belgium, the principal foreign sources of supply, is largely a household or small shop industry requiring relatively little machinery, production may be resumed quickly after the war. Also most of the raw skins (sheep and goat) consumed by these countries in the production of gloves are obtained from Southern European countries, whose flocks have been affected but little by the war. Although imports may be about the same as in 1939, it should be noted that imports in that year were only about 60 percent of the average quantity and value of imports during the 3-year period 1936-38.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Duty as in 1939.—Per capita consumption would probably be the same as in the period 1936-38 (the 1939 figure being abnormally low). By reason of an increase in population, total consumption would probably increase 10 percent and might be 16 million pairs. Assuming that imports would supply about 34 percent of domestic consumption (as in 1936-38), they would be about 5½ million pairs, with a foreign value (at 1939 unit prices) of about 4.6 million dollars. Production for the domestic market would then be 10½ million pairs, valued (at 1939 unit prices) at about 12.8 million dollars.

Duty reduced by 50 percent.—Consumption might increase to about 18 million pairs and the share of imports in consumption would probably increase to as much as 50 percent. Production and imports might thus each be about 9 million pairs. The unit value of domestic production might decline somewhat as a result of the reduced duty, and the unit foreign value might possibly increase somewhat, but the extent of these effects can scarcely be estimated and are therefore disregarded. The foreign value of imports might be about 7.6 million dollars, and the value of domestic production about 11 million dollars.

Duty increased by 50 percent.—Consumption would probably decline to about 15 million pairs and the share of imports in consumption might be about 20 percent, well below the 1936-38 average. Imports might amount to about 3 million pairs, with a foreign value of about 2.5 million dollars. Production for the domestic market would then amount to about 12 million pairs, valued at 14.6 million dollars.

Per capita income 75 percent higher than in 1939.

Such an increase in income might result in a quantitative increase of about 50 percent over the estimated consumption at the 1939 income level. Prices would probably increase to the same extent as the rise in the general price level, i. e., 10 to 15 percent.

Duty as in 1939.—Consumption might reach 24 million pairs. It may be assumed that there would be a higher ratio of imports to

consumption than with income as in 1939, because at higher income levels there would be a relatively greater demand for foreign gloves. Imports might account for about 40 percent of consumption, or amount to as much as 10 million pairs, with domestic production amounting to about 14 million pairs. The foreign value of imports, at increased prices, might be about 9.5 million dollars, and the value of production for the domestic market about 19.5 million dollars.

Duty reduced by 50 percent.—Consumption might increase to about 27 million pairs and the ratio of imports to consumption might rise to over 60 percent. Imports would thus amount to about 17 million pairs, with a foreign value of about 16.1 million dollars. Production for the domestic market would amount to about 10 million pairs, valued at about 18.8 million dollars.

Duty increased by 50 percent.—Consumption would probably be smaller than with no change in duty, amounting to about 22 million pairs. In view of the strong demand for foreign gloves because of the prestige attached to them and the probable willingness of foreign producers to lower their price in order to offset part of the increase in duty, imports would probably not fall below about 6 million pairs, in which case domestic production would be about 16 million pairs. At prices affected somewhat by the change in duty, the foreign value of imports would probably be about 5.5 million dollars, and the value of production for the domestic market about 22 million dollars.

Exports

Domestic exports of women's and children's leather dress gloves have always been small and amounted to less than 1 percent of the value of production in 1939. Exports in the post-war years will probably form about the same ratio to production as in 1939.

Employment

On the basis of the above estimates of production, employment in the long-term post-war period might range between 4,500 and 9,000 persons, depending upon the level of duty and national income.

FISHHOOKS

Tariff paragraph: 1835.
Commodity: Fishhooks.
Rate of duty: 45%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Value (\$1,000).....	300	575	925	Percent 62

¹ Estimated export data not available; probably negligible.
² Landed value; foreign value was \$381,000.

Fishhooks are sold for commercial as well as for sport fishing and may be used plain with natural bait, such as worms, or combined with other materials in the manufacture of artificial flies or bait. Before the war, the United States depended largely on foreign sources for certain styles and sizes of hooks; domestic production was limited to two or three manufacturers. Since the beginning of the war in Europe imports of fishhooks have ceased, and the entire supply has been furnished by domestic manufacturers. A substantial domestic industry has been built up, and post-war competition between foreign and domestic hooks will probably be much greater than before the war.

Before the war Norway was the principal supplier of fishhooks, although England was also an important source. Imports from Norway consisted of all varieties and sizes of hooks, whereas those from England were generally small, high-quality hooks made in needle factories and used in this country in the making of artificial flies. Because of the considerable amount of hand labor and the technical knowledge involved in the manufacture of very small, special-type hooks, it is possible that domestic producers will prefer to continue importing these types.

POST-WAR SHORT TERM

There will be a considerable postponed demand for fishhooks, especially of types used for sport fishing. Consumption may increase by as much as 40 percent over that in 1939; and domestic production may supply as much as half the total consumption. Both Norway and England will probably be in a position to export large quantities of fishhooks, and United States imports in the years immediately following the war will probably be greater than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

With an increase in population it is likely that consumption of fishhooks might be about 10 percent above that of 1939, and be valued at about 1 million dollars. Consumption would be affected only to an insignificant extent by a 50-percent change in the duty.

Duty as in 1939.—Imports would probably supply a smaller proportion of consumption than in pre-war years—possibly not more than 40–50 percent—because of developments in the domestic fishing-tackle industry in recent years. The landed value of imports would thus be \$400,000–\$500,000 (\$280,000–\$330,000 foreign value), and the value of domestic production would be about \$500,000–\$600,000.

Duty reduced by 50 percent.—Price will be an important competitive factor and a reduced duty would increase the proportion of consumption supplied by imports, perhaps to as much as three-fourths of the total. The landed value of imports might thus be \$600,000–\$750,000

(about \$475,000–\$585,000 foreign value), and domestic production would then amount to \$250,000–\$400,000.

Duty increased by 50 percent.—This increase in duty would probably reduce imports to a landed value of \$250,000–\$300,000 (about \$145,000–\$175,000 foreign value) and would increase domestic production to \$700,000–\$750,000.

Per capita income 75 percent higher than in 1939.

Consumption might be 50 percent higher than if incomes were at the 1939 level, or about 1½ million dollars. Although a small part of this increase would be the result of higher prices, the greater part would result from more extensive commercial fishing, and from more leisure time and greater per capita expenditure for sport fishing.

Duty as in 1939.—Imports might supply 40–50 percent of consumption and have a landed value of about \$600,000–\$750,000 (\$400,000–\$500,000 foreign value). Domestic production would then amount to \$750,000–\$900,000.

Duty reduced by 50 percent.—Imports might supply as much as 70–80 percent of consumption, in which case the landed value of imports would be 1.0–1.2 million dollars (about \$800,000–\$950,000 foreign value). Domestic production would then be valued at \$300,000–\$500,000.

Duty increased by 50 percent.—Under a higher duty, imports would decline and would probably have a landed value in the neighborhood of \$350,000–\$500,000 (\$200,000–\$290,000 foreign value). Domestic production would amount to 1.0–1.2 million dollars.

Exports

During the war United States exports have been large, especially of those types suitable for commercial fishing. This was the result of an understanding with the United Kingdom under which the United States agreed to supply hooks to Greenland, Iceland, and other Western Hemisphere countries. It is probable that, following the war, Norway and the United Kingdom will resume their exports of hooks to the main fishing areas of the world and that United States exports will again become small.

Employment

The production of hooks in the United States in 1939 was largely by machine and required comparatively few workers. The type of small hooks requiring individual filing or shaping has not been produced to any extent in the United States even during the war, and it is not likely that they will be produced in the future. Probably more employees will be engaged in sorting, packaging, and labeling hooks than in manufacturing them.

RUBBER TIRES AND INNER TUBES

Tariff paragraph: 1537 (b).

Commodity: Rubber tires and inner tubes.

Rate of duty: Automobile, motorcycle, and bicycle tires, 10% ad val.; other tires and inner tubes, 25% ad val.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000)	503,448	18,789	484,659	155	484,814	Percent (%)
Persons employed (number)	67,000					

1 Estimated landed value; foreign value was \$132,000.

2 Estimated.

3 Less than 0.1 percent.

Casings (open tires requiring tubes) and inner tubes for autos, trucks, and busses account for about 95 percent of the domestic production of all types of vehicular tires and tubes and for about the same proportion of exports. About three-fourths of all the rubber consumed in the United States is used in the production of tires and tubes. In 1939 the United States had 68 percent of the world's motor vehicles and produced an even greater percentage of the world's output of tires and tubes.

Imports, which have always been small, consist largely of tires for passenger cars, trucks, and busses; only part of them, however, are directly competitive with domestic tires, the other part consisting of special types and sizes for use on foreign cars driven in the United States. Canada has been the principal source of the competitive type; France and the United Kingdom are suppliers of both types.

Despite the rapidly expanded production of synthetic rubber in the United States after most natural rubber sources were cut off, tire production was drastically limited until late in 1944. The necessity of producing many bus and truck tires for essential transportation equipment has limited even further the production of passenger-car tires. Although domestic capacity for the production of tires and tubes is being considerably expanded, and new facilities will be available late in 1945 or early in 1946, it may take some time to satisfy the huge postponed civilian demand. However, since two or more passenger-car tires may be produced with the raw materials, labor, and time required to make an average truck tire, any reduction in the number of truck and bus tires manufactured after the war would permit the production of a much larger number of passenger-car tires, even though some truck-tire equipment is not readily adapted to the manufacture of smaller tires.

Consumption fluctuates somewhat with changes in general economic conditions, but the decrease during depression periods is much less than in many other commodities.

POST-WAR SHORT TERM

Imports of tires will probably be even smaller than in 1939. Consumption, both for new cars and for replacement will be very large. The production of truck and bus tires may be smaller than during the war, but much larger than in 1939, and the output of passenger-car tires will probably be larger than in any previous year.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption might be valued at as much as 550 million dollars, an increase of 15 percent over 1939. Part of this increase will result from an increase in population; other factors also taken into account are the probable continuation of the pre-war upward trend in tire consumption, which will result from possible higher driving speeds, more traveling, and more airplanes, but these factors might be offset to some degree by possible improvements in the quality of tires and by lower rubber prices.

The total value of tire and tube production in the United States might reach 575 million dollars, about 25 million of which might be for export.

Duty as in 1939.—Imports would probably continue to supply a small part of United States consumption of tires and tubes, the foreign value of which might amount to as much as \$150,000.

Duty reduced by 50 percent.—A reduction in duty would probably offer some incentive to producers of competitive tires in Canada and other countries, but imports would probably still not exceed \$250,000.

Duty increased by 50 percent.—This would affect only the imports of competitive tires; the foreign value of imports would probably not be much below \$125,000.

Per capita income 75 percent higher than in 1939.

An increase in the per capita income would probably have a pronounced effect on total United States consumption of tires and tubes. Automobile sales quickly respond to upward swings in purchasing power, and drivers are more inclined to purchase new tires rather than have old ones recapped. Consumption might reach or even exceed 800 million dollars, an increase of about 45 percent over consumption with income as in 1939. This amount would include a price increase that would result from an increase in the national income. Production for the domestic market would be almost the same as consumption. Total domestic production would have an even higher value, because of the large exports, the value of which would probably be considerably higher than in pre-war years. Changes in duty would probably have little effect on total consumption or production.

Duty as in 1939.—Imports of tires and tubes would probably be larger during a period of prosperity, because more foreign cars would likely be imported and because of the greater market for competitive tires; the foreign value of imports might amount to as much as \$250,000.

Duty reduced by 50 percent.—This change would not materially affect the imports of tires or tubes for foreign cars in the United States. It might increase quite substantially the imports of competitive tires; the foreign value of total imports might amount to as much as \$300,000.

Duty increased by 50 percent.—This increase in duty might reduce somewhat the imports of competitive types but would have little effect on shipments of special types. Imports might have a foreign value of about \$200,000.

Exports

Exports of tires and tubes, which were valued at about 19 million dollars in 1939, represented less than 5 percent of domestic production but constituted a profitable and fairly important part of the industry's business. Tires and tubes for passenger cars, trucks, and busses accounted for about 95 percent of the exports, about evenly divided between passenger-car tires and truck and bus tires. Exports immediately after the war may be a little larger than in 1939, as the rehabilitation of war-affected areas will likely require more tires than can be produced locally. The foreign demand will be supplied in part by substantial quantities of military tires suitable for trucks and busses, the kind most needed for rehabilitation work. Some such tires may be left in a number of areas when United States armed forces will have been withdrawn. Over the long-term period, exports will probably be well sustained and, under favorable conditions as to world income, may very considerably increase.

Employment

Employment in the tire and tube industry in 1939 was approximately the same as the average for the 9 years preceding. Employees numbered about 67,000, of which about 54,000 were wage earners. During the war, employment has increased to about 78,000 and will be well over 85,000 when added facilities now being prepared are finished. It is probable that employment in the immediate post-war period will be at least 85,000, and that during the long-term period it might range between 75,000 and 110,000 persons, on the basis of the estimated minimum and maximum production.

MUSICAL INSTRUMENTS AND PARTS

Tariff paragraph: 1541 (a).

Commodity: Musical instruments and parts, except pianos and organs.

Rate of duty: Various.

Equivalent ad valorem (1939): On dutiable items, 37%.

NOTE.—The rate fixed in the Tariff Act of 1930 on musical instruments and parts included in this report was 40 percent ad valorem, except for violins (\$1.25 each plus 35 percent, or duty-free if made prior to 1901), bridges for fretted stringed instruments (50 percent), cases (50 percent), and tuning pins (\$1 per 1,000 plus 35 percent). The duty on wood-wind instruments and tuned bells or chimes was reduced to 30 percent, effective June 15, 1936, and January 1, 1939, respectively, pursuant to trade agreements with France and the United Kingdom; and the duty on music boxes and cymbals was reduced to 20 percent, effective February 15, 1936, and May 5, 1939, pursuant to agreements with Switzerland and Turkey.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Value (\$1,000).....	10,997	441	10,556	15,220	15,776	Percent 83
Persons employed (number).....	3,191					

¹ Estimated landed value; foreign value was \$3,569,000.
² Estimated.

This section covers all musical instruments and parts except pianos and organs, imports of which were unimportant in 1939, although the domestic production exceeds that of all other musical instruments combined except phonographs, parts, and records (covered in a separate section). Band and orchestra instruments account for about 60 percent of the total value of domestic production. Accordions and harmonicas (mouth organs) are the principal imports of this group, and they represent about 60 percent of the value of total imports.

Comparative data on the principal classes of musical instruments covered by this statement, in domestic production, in imports, and in exports for the year 1939 are given in the table below. Brass and wood-wind instruments accounted for approximately 46 percent of the total value of domestic production, and stringed and percussion instruments for almost one-third. The value of domestic-made accordions was equivalent to about 9 percent of the total for all instruments. Accordions accounted for approximately 43 percent of the total imports in 1939, harmonicas accounted for 18 percent, and wood-wind instruments (consisting principally of clarinets) accounted for 15 percent. Accordions were imported almost entirely from Italy and Germany, harmonicas from Germany and Japan, and clarinets from France.

Musical instruments, parts, and accessories: United States production, imports, and exports, by principal classes, 1939

(In thousands of dollars)

Class ¹	Domestic production		Imports		Exports	
	Value	Percent of total	Value ²	Percent of total	Value	Percent of total
Brass-wind instruments.....	2,787	25.4	173	4.8	97	22.0
Wood-wind instruments.....	2,289	20.8	526	14.7	113	25.6
Stringed instruments.....	1,532	13.9	240	6.7	159	36.1
Strings.....	597	5.4	31	.9	n. e. s.	
Percussion instruments.....	1,469	13.4	127	3.8	44	10.0
Accordions.....	959	8.7	1,530	42.9	n. e. s.	
Harmonicas.....	n. e. s.		644	18.0	n. e. s.	
Music boxes.....	n. e. s.		295	8.3	n. e. s.	
Other instruments, parts, and accessories ³	1,364	12.4	104	2.9	28	6.3
Total.....	10,997	100.0	3,569	100.0	441	100.1

¹ The figure for each principal class specified includes certain parts and accessories.
² Foreign value.
³ Chiefly cymbals and parts, from Turkey.
⁴ Including \$69,000 worth of accordions (other than piano accordions) and concertinas.
⁵ Does not include pianos, organs, or phonographs.
⁶ The figure is for "other musical instruments" only.

In general, a 50-percent decrease in the duties would probably result in a substantial increase in imports of these musical instruments, particularly harmonicas, accordions, and clarinets, and bring about a decline in domestic production. A 50-percent increase in duties, on the other hand, would result in substantially smaller imports and increased domestic production. It seems unlikely that the total consumption of musical instruments would be sufficiently affected by a 50-percent increase or decrease of the duties to warrant separate estimates.

POST-WAR SHORT TERM

Consumption of these musical instruments during the immediate post-war period might be materially larger than in 1939. This is anticipated on the basis of an assumed higher national income than in 1939 and of the probability of a much greater consumer demand resulting largely from the backlog of demand from the war years. Imports will probably be smaller than in 1939, because it will take some time before foreign producers will be in a position to export musical instruments in significant volume. Domestic production, therefore, will likely be substantially larger than it was before the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The demand for these kinds of musical instruments should continue to expand as a result of an increase in population and the extension of musical education. Domestic consumption might be as much as 15 percent over the 1939 level, or in the neighborhood of 18 million dollars.

Duty as in 1939.—Assuming that United States production for the domestic market,¹ and imports, would supply about the same proportions of consumption as in 1939, domestic production would amount to about 12 million dollars and the foreign value of imports would be about 4.1 million dollars (6 million dollars, landed cost).

Duty reduced by 50 percent.—The reduced duty would probably increase imports to a point where they might supply about 40 percent of consumption. The increase would probably be chiefly in accordions, harmonicas, and music boxes, which are relatively much more important in the import trade than in domestic production. In this case, imports would amount to about 5½ million dollars foreign value (about 7 million dollars landed value). Production for the domestic market would be valued at about 11 million dollars.

Duty increased by 50 percent.—The higher rates of duty would tend to reduce imports, especially of the types of instruments which are also produced in the United States. Total imports might decline to approximately 3 million dollars foreign value (about 5 million dollars landed cost). Production for the domestic market may be expected to increase and amount to about 13 million dollars.

Per capita income 75 percent higher than in 1939.

A high national income would probably result in more extensive musical education, a substantial increase in the number of bands and

¹ Production for exports would be additional; see the estimates in subsection on exports.

orchestras, and a general expansion in the sale of musical instruments. The value of domestic consumption of the instruments covered by this statement might therefore be one-half greater than with income as in 1939, or in the neighborhood of 27 million dollars, also allowing for a price increase of about 15 percent.

Duty as in 1939.—Assuming that, with no change in duty, domestic consumers would purchase domestic and imported instruments in about the same proportions as in 1939, the value of production for the domestic market might then be about 18 million dollars and the foreign value of imports about 6.4 million dollars (9 million dollars, landed value).

Duty reduced by 50 percent.—The foreign value of imports might be about 9 million dollars (10.8 million dollars, landed value), and production for the domestic market about 16.2 million dollars.

Duty increased by 50 percent.—The higher duty on medium-priced instruments would probably be partly absorbed by foreign producers but it would also tend to reduce imports somewhat. The foreign value of imports might decline to approximately 4 million dollars (about 6 million dollars, landed value). Production for the domestic market, in this case, would be valued at about 21 million dollars.

Exports

Assuming that exports of musical instruments will be about 5 percent of the value of total domestic production in the post-war long-term period, exports might, under a national (and world) income at the 1939 level, amount to about \$600,000, and under a high national (and world) income they might amount to as much as \$850,000.

Employment

The number of employees in the domestic production of musical instruments of the classes here covered will probably be generally higher after the war than the 3,200 employed in 1939. Since the bulk of the industry's output is for the domestic market, employment will be roughly in proportion to the estimated values of production under the various assumptions concerning national income and import duties, i. e., from perhaps 3,300 to 4,500 persons.

ROSARIES

Tariff paragraph: 1544.

Commodity: Rosaries, chaplets, and similar articles of religious devotion.

Rate of duty: 15% to 30% ad val. *Equivalent ad valorem (1939):* 21%.

NOTE.—The rate fixed in the Tariff Act of 1930 on rosaries, etc., of gold, silver, platinum, gold plate, silver plate, or precious or imitation precious stones, was 50 percent ad valorem, which was reduced to 30 percent, effective June 15, 1933, pursuant to the trade agreement with France. Rosaries, etc., composed of other materials which were dutiable at the tariff act rate of 15 percent, if valued at not more than \$1.25 per dozen, were subject to a reduced rate of 10 percent from April 15, 1933, to April 21, 1939, inclusive, pursuant to the Czechoslovak trade agreement.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 dozen).....	358
Value (\$1,000).....	184
Unit value (per dozen).....	\$0.51

¹ Foreign value.

A rosary or chaplet, as used in religious devotion, is a series of beads joined by a metal chain in combination with a medal and a crucifix. The beads are made of glass, china, wood, bone, plastic, or metal. The crucifix is usually of metal.

Most of the rosaries manufactured in the United States are composed of precious metal, or a combination of precious metal and gem stones or imitation gem stones. Domestic production of the cheaper grades of rosaries consists largely of the further processing of imported rosaries by plating the chains and by substituting better-quality medals and crucifixes.

Imports of rosaries are reported under the following classifications: (1) Made in whole or in part of gold, silver, platinum, gold plate, silver plate, or precious or imitation precious stones; (2) made of other material, valued at not more than \$1.25 per dozen; and (3) made of other material, valued at more than \$1.25 per dozen.

During 1936-38 total annual imports of rosaries averaged 491,494 dozen valued at \$225,442. Of these amounts, imports under the first of these classifications accounted for a little less than one-fourth (dutiable at 30 percent), those in the second classification for around three-fourths (dutiable at 15 percent), and those in the last classification the remainder (dutiable at 30 percent). Imports of rosaries in 1939 declined appreciably as compared with the years immediately preceding, because largely, no doubt, of disturbed conditions in Czechoslovakia, which was the principal source of imports.

The average annual unit value per dozen during 1936-38 of imports of rosaries in the first class was 53 cents, of those in the second class, 40 cents, and of those in the third class, \$2.16.

In the early 1930's France was the principal supplier of rosaries of precious metal or precious or imitation precious stones; after the rate of duty was reduced from 50 to 30 percent in the trade agreement with France in 1936, Czechoslovakia became the principal supplier. Imports of rosaries of "other material," valued at not more than \$1.25 per dozen, were furnished chiefly by Czechoslovakia during 1933-39, France being the secondary source of supply. Those of "other material," valued at more than \$1.25 per dozen, came principally from France in most years and secondarily from Czechoslovakia. In 1941, Japan, France, and China ranked in the order named as suppliers of total United States imports of rosaries. In 1943, virtually all of the imports came from Mexico.

POST-WAR SHORT TERM

Because the supply of rosaries from both domestic and foreign sources has been limited during the war, imports in the immediate post-war period will probably be considerably above the relatively low 1939 level, provided the foreign producing countries are in a position to supply the quantities demanded.

POST-WAR LONG TERM

Statistical information is not available concerning the production and consumption of rosaries in the United States; therefore it is impossible to make forecasts as to the effect thereon of duty changes.

The estimates for imports of rosaries are based largely on pre-war imports over a series of years. It is assumed that the long-term

trend of United States imports of rosaries will follow generally the trend in national income, that prices of rosaries will move correspondingly with the general price level, that an increase in population will be reflected in increased imports, and that a larger proportion of the total imports of rosaries will consist of the more expensive types when national income is high than when it is low.

It is probable that imports of rosaries would be increased slightly by reductions in rates of duty and decreased slightly by increases in rates, the effects of changes in rates being more pronounced on the higher-priced rosaries than on those lower in price. Since the unit cost of the bulk of the rosaries imported is relatively low, however, total imports probably would not be greatly affected by changes in rates of duty.

Per capita income at 1939 level.

It is possible that imports may total about 500,000 dozen valued, at 1939 unit prices, in the neighborhood of \$250,000 (foreign value).

Per capita income 75 percent higher than in 1939.

Imports might reach about 750,000 dozen valued, at increased prices at about \$450,000 (foreign value).

SPONGES

Tariff paragraph: 1545,

Commodity: Sponges.

Rates of duty: General, 7½ to 22½%; *Equivalent ad valorem (1939):* 16%.
Cuba, 6 to 18%.

Note.—The general rate on sheepswool sponges was reduced from 20 to 22½ percent ad valorem by proclamation of the President under section 306 of the Tariff Act, effective September 18, 1932. The general rate on yellow, grass, and velvet sponges was reduced from 25 to 15 percent ad valorem, and that on hardhead or reef sponges from 15 to 7½ percent ad valorem, both pursuant to the trade agreement with the United Kingdom, effective January 1, 1939. The general rate on other sponges remains at 15 percent ad valorem as fixed by the Tariff Act of 1930. The rates on sponges from Cuba have been 20 percent less than the general rates except that those on velvet and miscellaneous sponges (including hardhead or reef) have been 12 and 6 percent ad valorem, respectively, since September 3, 1934, by virtue of the trade agreement with Cuba.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 pounds).....	484	492	976	Percent 50
Value (\$1,000).....	1,162	1,476		
Unit value (per pound).....	\$2.40	\$0.97		
Persons employed.....	1,123			

¹ Catch by and value to fishermen. Exports are negligible.
² Foreign value.

The United States is the world's largest consumer of natural sponges, as well as one of the largest producers. In the decade preceding the war annual domestic consumption averaged about 1.1 million pounds, and domestic production supplied slightly more than half. Exports reached a peak of 124,000 pounds in 1929. Since then exports have shown a downward trend, amounting to only 55,000 pounds in 1938, the last year for which statistics are available.

Auto washing, the paint trades, and other industries use approximately four-fifths of the sponges consumed in the United States, and most of the remainder are used in homes.

Cuba supplied roughly two-thirds of the quantity and value of total imports, and the British West Indies (principally the Bahamas) supplied 32 percent of the quantity and 16 percent of the value. Mediterranean countries supplied most of the remainder, which consisted of high-priced species not produced in the United States, Cuba, and the British West Indies. These represented only about 5 percent in quantity but 15 percent in value of total imports.

The above data relate to the years preceding 1940. In 1939 a blight attacked the sponge beds in the Bahamas, killing most of the velvet, yellow, and hardhead sponges, and the great bulk of the sheeps-wool, grass, and reef sponges. The blight spread to the Cuban fishery, where its effect was reflected in Cuban exports in 1941; they were only one-fourth of the annual average for the 8 preceding years. It struck the Florida beds late in 1939 and was primarily responsible for cutting the 1940 catch to one-half of that of the preceding year. Since then the Florida beds have partly recovered and the Cuban beds have shown some improvement; in the Bahamas, however, the blight was so devastating that substantial recovery, even under the most favorable conditions, will take several years.

The available supplies of sponges from both domestic and foreign sources steadily declined from 976,000 pounds in 1939 to 374,000 pounds in 1943. Unit values, however, increased from \$1.68 per pound to \$8.65 per pound. Increasing demands, particularly in industries serving a variety of wartime purposes, in the face of decreasing supplies, are responsible for the tremendous increase in values.

Decreasing domestic production during the war may be attributed to a number of causes. The blight destroyed large producing areas; the Navy took over a number of the vessels which operated with diving equipment; and naval restrictions on offshore operations, particularly during the first 2 years of the war, circumscribed the areas fished by the remaining vessels using diving equipment. The vessels taken by the armed forces have since been returned to the owners or offered to them; also, practically all naval restrictions on offshore operations have been removed. However, production has not returned to pre-war levels, either because (1) all vessels may not have returned to the fishery, (2) there is a shortage of experienced divers, or (3) there are inadequate supplies resulting from the blight.

The decline in imports during the war is almost entirely the result of the blight in Cuban and Bahaman waters. Normally one-half of the Cuban exports come to the United States and most of the remainder go to European countries; about one-fifth of the Bahaman exports enter the United States and European countries take about one-half. Since the war has cut off the European markets, virtually all exports from Cuba and the Bahamas are shipped to the United States. However, annual imports from these sources in 1943 and 1944 were less than one-half of the imports during the pre-war years, but the value was more than double.

The following estimates are based upon the assumption that natural sponges will not be replaced to a material extent by manufactured sponges. To date it appears that a completely satisfactory substitute has not been produced. In the 1930's a cellulose sponge

was developed and marketed in increasing quantities. It possesses many of the properties of natural sponges, but it has not been readily accepted as a substitute for natural sponges for auto washing and in the paint trades, where the bulk of the natural sponges are used. Whether or not continuing refinements in simulating the properties of natural sponges will ultimately lead to a greater use of cellulose sponges at the expense of the natural product is uncertain.

POST-WAR SHORT TERM

During this period the annual consumption of sponges probably will not exceed 375,000 pounds, or less than two-fifths of the quantity consumed in 1939. Exports will continue to be insignificant. Unit prices will be much higher than before the war. Production will probably be about 200,000 pounds valued at 2 million dollars and imports may amount to 175,000 pounds with a foreign value of 1 million dollars. Thus, production will probably supply slightly more than one-half of the consumption, in quantity.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption may amount to 425,000 pounds, with production (on any of the assumptions regarding duties) supplying 225,000 pounds, valued at \$1,350,000, and imports, 200,000 pounds, with a foreign value of \$700,000. These quantities are much lower than in 1939 but the unit values much higher.

By that time the sponge beds may have recovered from the effects of the blight, but it is believed that a large majority of the sponges in them will still be young growths of unmarketable size. Moreover, in order to conserve breeding stocks, it is likely that limitations may be placed upon the catch of mature sponges of market size.

Information is not available on the sponge fishery in the Mediterranean area, hitherto a relatively unimportant source of United States imports. It is believed, however, that operations have been drastically curtailed during the war. If so, resumption may result in increased catches owing to greater propagation in beds unfished during the war. United States imports from this area will not, however, increase to the extent of substantially relieving the shortage of supplies from other sources, because most of the sponges produced in the Mediterranean area are of a quality and type not adapted to the industrial uses to which most sponges are put in the United States.

In view of the probability that available supplies of sponges will continue to be considerably short of the demand, a change in the duties is unlikely to affect materially either the quantity of production or of imports, or the unit values of domestic production and the foreign unit values of imports.

Per capita income 75 percent higher than in 1939.

The quantity of production and imports of sponges will depend almost entirely on the availability of supplies. In view of anticipated demands considerably in excess of available supplies, it is believed that a higher per capita income might result in average unit values about 50 percent higher than with no change in income, because the

cost of sponges is an insignificant part of the total cost of goods and services in which they are used.

Therefore, consumption will probably remain at about 425,000 pounds, with domestic production supplying 225,000 pounds, valued at about 2 million dollars, and imports supplying 200,000 pounds with a foreign value of about 1 million dollars. A 50-percent change in the duties would not be likely to affect the volume of production and imports, or to have a material effect upon their values.

Exports

Exports of domestic sponges have been declining for several years. In the face of decrease in both production and imports, it is doubtful whether this trade will be resumed.

Employment

The number of fishermen employed in the United States sponge fishery in 1939 was as follows:

Place of employment	Number
On vessels.....	258
On boats and shore, regular.....	865
Total.....	1,123

Although production in the long-term period will probably be only about one-half of the pre-war figure, scarcity of sponges in the beds, and continuing higher prices, will probably result in no material reduction in the number of fishermen employed.

PEAT MOSS

Tariff paragraph: 1548.

Commodity: Peat moss.

Rate of duty: 50¢ per long ton.

Equivalent ad valorem (1939): 2.9%.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (long tons).....	4,042	None	4,042	70,189	74,230	Percent 96
Value (\$1,000).....	56	-----	56	1,1,306	-----	-----
Unit value (per ton).....	\$13.91	-----	\$13.91	\$17.17	-----	-----

1 Foreign value.

Peat moss is used principally as a litter for poultry yards and stables, as a soil conditioner, and for packing.

In the years immediately before 1939, domestic consumption of peat moss was supplied principally by imports from Germany, Sweden, and the Netherlands. United States production was small, amounting to between 1,500 and 2,000 tons annually. With imports cut off from

Europe during the present war; prices have increased substantially and production has expanded in the United States and in Canada. United States production in the last few years has ranged from 10,000-13,000 long tons, and imports from Canada, which accounted for only 6,000 tons in 1939, were 45,000 in 1942 and 56,000 tons in 1943. Maine and Canadian moss are considered superior in quality to the moss formerly imported from Europe or that produced in Michigan, the principal pre-war source of United States peat moss, and such production as occurred in Maine before the war brought a higher price than that from Europe or other United States sources.

For 2 or 3 years before 1939, domestic consumption was at a fairly constant level of about 70,000 tons annually. Changes in production are relatively slow, since it takes 2 to 3 years to prepare the moss for market.

The tariff on peat moss in 1939 was 50 cents per long ton, equivalent to 3 percent ad valorem. Since then, however, moss of horticultural grades, normally comprising about half of the imports, has been entered duty-free as a fertilizer in accordance with a court decision. Both classes are included in the comment which follows. Imports of dutiable moss would probably not be appreciably affected by a 50 percent increase or decrease in the duty.

POST-WAR SHORT TERM

In spite of the increased domestic production and imports from Canada, domestic consumption during the war has not reached its pre-war level. In the immediate post-war period the demand is likely to be fully as great as, or perhaps greater than, in 1939, but it is doubtful whether supplies will be adequate to meet the demand. Germany, the former principal source, will probably not supply as much as in the years immediately preceding the war, but Sweden, the Netherlands, and Canada are likely to be more important sources than formerly.

POST-WAR LONG TERM

Per capita income at 1939 level.

By reason of larger population and probable continuance of the pre-war trend, consumption of peat moss may be expected to increase to about 85,000-90,000 tons, or 15-20 percent over 1939. Maine and Canada may continue to be important sources of supply and because the moss from those areas is of better quality than the European moss, the average price may be somewhat higher than in 1939. Imports will probably furnish the bulk of the consumption, say, 75,000-80,000 tons, valued at from 1.5-1.6 million dollars. This would mean that production for the domestic market would be about \$70,000-\$200,000.

Per capita income 75 percent higher than in 1939.

With the increased agricultural activity that would occur under a higher national income, there would be a greater demand for peat moss and consumption might reach as much as 110,000-115,000 tons. Of this amount imports may furnish from 100,000-110,000 tons, valued at 2.5-2.8 million dollars, an increase in quantity over 1939 of 42-56 percent. Under this assumption there might be no production for the domestic market or production might amount to as much as 15,000 tons, valued, at increased prices, up to \$230,000.

PENCILS

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1549 (a)---	Pencils of lead or other materials, not metal, not specially provided for:		
	Pencils of black, indelible, and colored lead.	50¢ per gross + 30% ad val.	} 37%.
	Pencils stamped with other than manufacturer's name or trade mark.	50¢ per gross + 25% ad val.	

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (gross).....	6,792,002	859,400	6,432,642	38,066	6,471,208	Percent 0.7
Value (\$1,000).....	9,246	565	8,681	131		
Unit value (per gross).....	\$1.60	\$1.67	\$1.60	\$6.98		
Persons employed (number).....	4,800-5,000					

1 Foreign value.

Pencils of the kind coming under this classification include wood and paper-cased pencils, the core of which consists of black, colored, or indelible lead. These pencils are usually classified in three retail price categories as follows: Two cents each (with inserted erasers); two for 5 cents and 5 cents each (usually with metal or plastic tips containing erasers); and 10 or 15 cents each (drawing or colored pencils without erasers). In terms of quantity, about 50 percent of the pencils consumed in the United States are medium-priced, about 20 percent are in the lowest-price range, and the remainder are high-priced pencils. When imprinted with other than the manufacturer's name or trade mark, pencils are used for advertising purposes or simply to carry the purchaser's name. Of the imports shown in the table for 1939, 16 percent on the basis of value consisted of pencils imprinted with other than the manufacturer's name.

In 1939 the quantity of imports amounted to less than 1 percent of domestic consumption, compared with approximately 2 percent in 1933 and about 3.4 percent in 1929. Imports in 1939 and earlier years consisted largely of higher-priced drawing pencils which came principally from Germany and Czechoslovakia. The average unit value of imports was about four times that of domestic production. One reason why imports consist principally of high-priced pencils is that the specific rate in the duty is more restrictive of imports of lower-priced pencils than of higher-priced ones.

The four largest pencil manufacturers in the United States accounted in 1936 for about 70 percent of domestic production. The three largest of these concerns were affiliates of foreign concerns or

had foreign branches. This concentration of control, extending to foreign producers, complicates the task of estimating the effects of changes in income and tariff rates in United States imports and exports, since the effects normally to be expected may be altered by other considerations.

Domestic manufacturers have specialized in the production of low- and medium-quality pencils and have gained a strong competitive position in this field. This is evident from the fact that exports, which have consisted of the low- and medium-grade pencils, have always exceeded imports by a considerable margin, even in terms of value. Exports have usually gone to a large number of foreign markets in direct competition with manufacturers in Germany, Czechoslovakia, and Japan. Pencil manufacturing both in the United States and abroad is largely an assembling process, a large part of which is performed by automatic machinery.

For a short period, around 1933, Japan exported large quantities of low-grade pencils to the United States at unit values substantially below United States prices, but the quality was so inferior by comparison with domestic pencils that the Japanese pencils did not remain long on the market.

POST-WAR SHORT TERM

During the war there has been a shortage of pencils of certain grades and qualities because of wartime restrictions on production. It may, therefore, be expected that consumption in the immediate post-war years will be at a much higher level than in 1939. Domestic production will probably be substantially larger than in 1939, but imports are likely to be smaller because of the time that will probably be required for Czechoslovakia and Germany to increase production to a point where exports can be resumed in substantial volume.

POST-WAR LONG TERM

Consumption, Production, and Imports

In making the following estimates it is assumed that domestic producers will continue in the future, as in the past, to supply the great bulk of United States consumption of low- and medium-priced pencils, and that imports will consist generally of the higher grade pencils for drawing and drafting. A 50-percent reduction in the duties on pencils would probably not be sufficient to enable foreign producers to compete extensively with domestic producers in the low- and medium-priced fields, although such a reduction would probably result in increased imports of high-priced pencils. As pointed out above, the duties contain a specific as well as an ad valorem rate, and the specific rate would probably still be restrictive of imports of low-priced pencils even if it were reduced by 50-percent.

Per capita income at 1939 level.

Per capita consumption would probably be about the same as in 1939. Because of the increased population, total consumption would probably be in excess of 6 million gross, and would probably not be significantly affected by a 50-percent change in the duties.

Duty as in 1939.—The ratio of imports to total consumption would probably be approximately the same as in 1939. Under this assump-

tion, imports would be in the neighborhood of 42,000 gross, with a foreign value, at 1939 prices, of about \$250,000. Production for domestic consumption would probably be about 5.9 million gross valued at about 9.4 million dollars.

Duty reduced by 50 percent.—Imports would probably be considerably larger than in 1939, supplying, say, as much as 2 percent of consumption; they might amount to as much as 120,000 gross with a foreign value, at 1939 prices, of about \$720,000. Production for domestic consumption would amount to about 5.8 million gross, valued at about 9½ million dollars.

Duty increased by 50 percent.—An increase in the duty might reduce very little the ratio of imports to domestic consumption because so large a part of the imports that come in consist of higher priced pencils needed by professional people. Imports might be about 30,000 gross, with a foreign value of about \$190,000. Production for domestic consumption would be only slightly under 6 million gross, valued at about 9.6-million dollars.

Per capita income 75 percent higher than in 1939.

Consumption of pencils on a per capita basis might increase as much as 75 percent compared with 1939, in which case total consumption would amount to about 10½ million gross. Per capita pencil consumption in the United States has always increased with an increase in national income. In 1931 per capita consumption was 5.31 per person and rose to 7.29 per person in 1937, an increase of 35 percent. During the same period, national income increased by only 26 percent. Again in 1941, when national income was 32 percent higher than in 1937, per capita consumption of pencils was 42 percent higher. Increases in business activity and other factors, result in much greater use (and also, probably greater waste) with partial utilization of pencils when times are good, and the reverse occurs in bad times.

Duty as in 1939.—Imports might be expected to supply about the same proportion of domestic consumption as in 1939. It is, therefore, estimated that imports would approximate 75,000 gross, with a foreign value of \$480,000 allowing for a 10-percent increase in prices. Production for domestic market might be about 10.4 million gross, valued at increased prices at about 18.3 million dollars.

Duty reduced by 50 percent.—The ratio of imports to consumption might increase to as much as 2 percent, in which case imports would amount to about 210,000 gross and would have a foreign value, at increased prices, of about 1.4 million dollars. Production for the domestic market would be about 10.3 million gross, valued at increased prices at about 18.1 million dollars.

Duty increased by 50 percent.—An increase in duty would probably reduce the ratio of imports to domestic consumption considerably. Imports might be about 50,000 gross and the foreign value of such imports, at increased prices, would be about \$330,000. Production for the domestic market would amount to about 10.4 million gross, valued at increased prices at about 18.3 million dollars.

Exports

In the pre-war decade 1929–39, exports were larger than imports in every year except 1933. In 1939 they amounted to 360,000 gross, and in 1941 they reached 770,000 gross or 9 percent of domestic pro-

duction. United States exports in the short-term post-war period will probably be substantially higher than in 1939 since the German, Czechoslovak, and Japanese producers may not be able to export important quantities of pencils in this period. In the long-term post-war period United States exports might increase about 10 percent over 1939 with the per capita income at the 1939 level and might increase about 90 to 100 percent over 1939 with per capita income 75 percent higher than in 1939.

Employment

In the pre-war period, between 4,500 and 5,000 persons were employed in making wood- and paper-cased lead pencils. In the long-term period, assuming a 1939 income level, employment might reach 6,000 wage earners; assuming a 75-percent increase in income, it might increase to 7,000-8,000 persons.

CAMERAS AND PARTS

Tariff paragraph: 1551, 228 (b).

Commodity: Cameras and parts.

Rate of duty: 20% ad val., except for cameras in which the lens is the component of chief value and which are dutiable at 45% ad val.

NOTE.—Imports of cameras in which the lens is the component of chief value were a very minor part of the total. In 1939, 47 such cameras, with a foreign value of \$2,771, were imported.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Appar-ent con-sump-tion	Ratio of imports to con-sump-tion
	Total	For export	For domestic market			
Value (\$1,000).....	\$ 19,000	2, 198	\$ 17,000	\$ 3, 600	\$ 20, 600	<i>Percent</i> 17
Persons employed (number).....	10, 000					

¹ Imports from Japan of 601,980 box cameras with a unit value of slightly more than 1 cent each are excluded from this statement since they are "imitation" cameras.

² Estimated.

³ Estimated landed value; foreign value was \$2,905,000.

⁴ The average ratio of imports to domestic consumption of comparable cameras for the 2-year period 1937-39 would be about 34 percent.

This section covers all types of cameras and parts. In recent pre-war years motion-picture cameras and parts accounted for about a quarter of domestic production on the basis of value, and professional and commercial cameras and parts for about one-third of the total. Amateur cameras and parts, accounting for the remainder of domestic production, were by far the most important element in the import trade.

United States imports of cameras and parts in 1939 were 30 percent less than for the average 1937-38, but were higher than in earlier years. The smaller importation in 1939 probably resulted from the unsettled conditions in Europe in the latter part of the year and from the countervailing duties imposed on imports from Germany in April

1939. Despite these circumstances, the imports in 1939 were fairly representative of the trade in the 5 years preceding the war. In any case, the future import trade in cameras will be predominantly influenced by the policies of the United Nations with respect to German economy and by the developments in the domestic industry referred to in the following paragraphs.

The pre-war imports of cameras and parts came almost entirely from Germany and were for the most part higher priced than most of the cameras produced in the United States. Parts for imported cameras represented only a small portion of the imports. More than half of the imported cameras retailed in the United States for at least \$50 per camera and catered to the demands of "serious amateur" photographers. The domestic producers shortly before the war were preparing to enter this field and were especially centering their attention on the production of miniature cameras, which had accounted for about half of the total imports in the few years preceding the war.

The German camera industry may be materially affected by the peace terms imposed upon that country. If the manufacture of optical lenses should be restricted or eliminated under such terms, the camera industry would undoubtedly be seriously affected. With this in view, the estimates given below are made upon the basis of two assumptions, namely, (1) that the German camera industry will not survive, and (2) that the industry will survive, at least in part, and will endeavor to regain its pre-war export markets. Except for Germany, no other country is likely to become a significant factor in the United States market.

It is probable that changes in the duty of 50 percent in either direction would not affect the volume of imports or domestic production sufficiently to be taken account of in the following estimates.

POST-WAR SHORT TERM

A considerable expansion over pre-war levels will probably occur in the camera industry not only because of higher incomes, but for special reasons: (1) The return of war veterans who are expected to be more interested than formerly in photography; (2) the growing popularity of tabloid newspapers and pictorial magazines which use photographs made by both amateurs and professionals; (3) the introduction of color photography on a wide scale; and (4) the great expansion in the filming of amateur motion pictures. It is unlikely that imports in the immediate post-war years will be significant, even if the German industry survives the war.

POST-WAR LONG TERM

Consumption, Production, and Imports

A moderate increase in the use of cameras is likely to occur independently of increase in population or national income, as a result of the growing popularity of amateur photography, the introduction of color photography, and increased interest in amateur movies.

Domestic production will presumably continue to supply the bulk of all types of cameras used in the United States and will probably supply a larger part than before the war of those types of cameras which were formerly largely imported from Germany, even if manufacture of optical lenses in Germany is not prohibited or restricted.

Per capita income at 1939 level.

Purchases of cameras and parts in the United States might approximate 26 million dollars, representing a 25-percent increase over 1939.

Elimination of the German camera industry.—Under this assumption, domestic producers would be able to replace very largely, if not entirely, the proportion of consumption formerly supplied by imports.

Revival of the German camera industry.—It is likely, in view of pre-war developments undertaken by the domestic industry to meet German competition in the high-priced miniature-camera field, that imports would supply a smaller proportion of consumption than in pre-war years. Even with revival of the German industry, therefore, imports might not exceed the 1939 level or about 3 million dollars, foreign value. The value of production for domestic consumption would then be in the neighborhood of 23 million dollars.

If most of the imports should be, as they have been in the past, relatively high-priced cameras enjoying distinct prestige in the United States, a decrease in the duty would probably tend to increase imports only slightly over the above estimate. A reduction in duty from 20 to 10 percent would not lower the price of such cameras in the United States sufficiently to reach a lower income bracket of purchasers. Similarly, an increase in duty would probably not decrease imports materially, for the reason that persons in a position to pay for the more expensive cameras would not be deterred by a relatively slight increase in prices. Moreover, foreign producers would undoubtedly be willing to absorb some of the increase in duty rather than lose their competitive position in this price field.

Per capita income 75 percent higher than in 1939.

Purchases of cameras might amount to about 50 million dollars, or approximately 100 percent more than with an unchanged income. This estimate takes account of the probability that prices may be higher by about 15 percent than they would be under the lower levels of income. Cameras are luxury items and high income would not merely increase the number purchased but add to the proportion of high-priced cameras purchased.

Elimination of the German camera industry.—Under this assumption, domestic producers would be able to supply practically the whole domestic demand.

Revival of the German camera industry.—Under a higher national income and a greater demand for expensive cameras, including those of foreign manufacture, the ratio of imports to domestic production might be slightly greater than under the lower level of income. The foreign value of imports might amount to as much as 6-7 million dollars. Production for domestic consumption under such conditions would be in the neighborhood of 43 million dollars. As under the 1939 income assumption, an increase or decrease of 50 percent in the duty would presumably affect imports to some extent, but not greatly.

Exports

Exports of cameras and parts from the United States are likely to be relatively large, amounting in the long-term period to possibly about 3-6 million dollars, depending on the level of world income. A still larger increase would be likely if the German camera industry and German exports were eliminated. The improvement in American precision cameras and lenses, and the introduction of color photography should provide great stimuli to our exports. The amount of exports from this country would, however, be largely dependent upon the policy of domestic concerns which own important manufacturing subsidiaries in Canada, England, France, Germany, and Australia.

Employment

There were about 10,000 wage earners employed in the industry in 1939. Although a considerable increase in production is expected in the long-term period, employment would probably not increase proportionately. Many cameras and camera parts of the less expensive items, which predominate in volume, can be manufactured by mass-production methods. However, the cameras selling at a retail price of over \$18.50 need skilled craftsmen for the necessary hand work. Employment might be 12,000 at the 1939 level of income, and 16,000 at the 75-percent increase in income (assuming that the German industry regains its pre-war status).

RAW FILMS AND DRY PLATES

Tariff paragraph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1551	Amateur, professional and motion-picture films and dry plates, sensitized and unexposed (raw films and plates):		18%.
	Dry plates	15% ad val.	
	Motion-picture films 1 in. or more in width.	2/10¢ per linear ft. on basis of 1½ in. width.	
	All other films	12½% ad val.	

NOTE.—The rates fixed in the Tariff Act of 1930 were 20 percent ad valorem on the dry plates, 4½ cent per linear foot on basis of 1½ inch width on motion-picture films 1 inch or more in width, and 25 percent ad valorem on all other films. The rates were reduced to those shown above, effective May 1, 1935, pursuant to trade agreement with Belgium.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 square feet).....	1 300,000			(¹)		Percent
Value (\$1,000).....	66,598	7,190	59,408	3,490	62,898	5
Unit value (per square foot).....	1 90.18					
Persons employed (number).....	1 5,000					

¹ Estimated.

² Quantity data for imports are in terms of different units of measurement (such as number of rolls, packs, or sheets) which cannot be reduced to a single unit.

³ Estimated landed value; foreign value was \$2,824,000.

The foregoing statistics and this section cover all types of unexposed photographic film and dry plates for still and motion-picture cameras. Film for still cameras includes roll or cartridge film, pack sheets, X-ray film and miscellaneous film for commercial purposes; unexposed motion-picture film comprises reversal, positive, and negative in all widths. The value of unexposed film produced in the United States has increased constantly since about 1933. During the war, production has increased very substantially over the 1939 level; film is an essential war commodity needed in large quantities for aerial photography, training, and X-ray purposes. In 1939 domestic production was made up as follows: Motion-picture film, 54 percent; roll film, 19 percent; X-ray film, 15 percent; and dry plates and pack sheets, 12 percent.

By value imports in 1939 consisted of motion-picture film about 50 percent; roll film, 35 percent; X-ray film, 2½ percent; plates and pack sheets 8 percent. In 1939, imports were slightly higher than 1938 and represented a typical pre-war level. Belgium furnished about 60 percent and Canada about 36 percent, and small quantities were also brought in from Germany, France, Italy, and the United Kingdom. Canada was the most important source of imports, supplying largely positive motion-picture film from the Canadian subsidiary of the largest American film manufacturer. Raw film from Canada is generally used by the domestic motion-picture industry for making motion pictures and is then reexported under benefit of draw-back. Imports from Belgium, consisting largely of roll film for amateur use, have been comparatively low in price.

POST-WAR SHORT TERM

Consumption of all kinds of film will probably increase substantially. A greater interest in amateur photography, including motion pictures, the introduction of color photography, the growing popularity of tabloid newspapers and pictorial magazines, a great increase in the use of X-ray film for dental, medical, and industrial purposes, an expansion in the use of microfilm for record keeping, and a new use for film in television will be among the reasons responsible for this increase. Educational, advertising, industrial, and selling film are also expected to increase greatly during this period. Domestic production will supply the bulk of this consumption; imports will probably be at about the 1939 level.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

As a result of a basic upward trend in the demand for every kind of unexposed film, consumption in the long term may increase by as much as 100 percent over the 1939 level, or to about 125 million dollars. Consumption would be somewhat affected by the level of duty, but probably not enough to warrant separate estimates.

Duty as in 1939.—On the assumption that imports would supply about the same proportion of domestic consumption as in 1939, the landed value of imports would amount to about 6 million dollars (about 5 million dollars foreign value). Production for the domestic market would then amount to about 119 million dollars.

Duty reduced by 50 percent.—A reduction in duty would probably result in substantially larger imports. The landed value of imports might amount to as much as 9 million dollars (about 8 million foreign value). Production for domestic consumption would then amount to about 116 million dollars.

Duty increased by 50 percent.—An increase in duty would tend to restrict imports to some extent but probably not much under the level in 1939, if at all. The landed value of imports might amount to about 5 million dollars (about 4 million dollars foreign value), and the value of production for the domestic market would then be about 120 million dollars.

Per capita income 75 percent higher than in 1939.

The demand for film would, from all present appearances, receive great additional stimulus from any marked increase in consumer purchasing power. Consumption might increase by as much as 75 percent over the estimate for income at the 1939 level, or to about 220 million dollars.

Duty as in 1939.—Assuming, as above, that imports would probably supply about the same proportion of consumption as in 1939, the landed value of imports would amount to about 10 million dollars (about 8½ million dollars foreign value), and the value of production for the domestic market to about 210 million dollars.

Duty reduced by 50 percent.—On the basis of the same ratio of imports to consumption as at the lower level of national income, the landed value of imports might be in the neighborhood of 15 million dollars (about 13 million dollars foreign value), and the value of production for the domestic market about 205 million dollars.

Duty increased by 50 percent.—With an increased duty, the landed value of imports would probably not exceed 5 million dollars (about 4 million dollars foreign value), and the value of production for the domestic market would probably be in the neighborhood of 215 million dollars.

Exports

It is probable that exports of raw film from the United States will be relatively large, with the total in the long term period amounting to about 15 million dollars, assuming world income to be at the 1939 per capita level. With a 75 percent increase in income, exports might amount to 20 million dollars annually, or possibly considerably more, depending partly on the business policy of domestic producers, who, before the war, owned subsidiaries in Germany, France, Canada, England, and Australia. The great advances made during the war in production methods and new types of film, together with the fact that domestic production has been greatly stimulated by the war, should place domestic producers in a very favorable position.

Employment

There were estimated to be about 5,000 wage earners in the industry in 1939. Although a considerable increase in production is expected in the long-term period, employment would probably not increase proportionately. Employment might reach a total of about 8,000 under the 1939 income level, and of about 10,000 under a 75 percent increase in income.

MOTION-PICTURE FILMS

Tarif para- graph	Commodity	Rate of duty	Equiva- lent ad valorem (1939)
1551	Exposed negatives, whether developed or undeveloped, and positives, prints, or duplicates:		24%
	Negatives.....	2¢ or 3¢ per linear ft.	
	Positives.....	1¢ per linear ft.	

Note.—Rates shown above are those fixed in the Tariff Act of 1930. They were all reduced 50 percent, effective January 30, 1943, pursuant to the trade agreement with Mexico.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent cost of consump- tion	Ratio of imports to con- sumption
	Total	For ex- port	For do- mestic market			
Quantity (1,000 linear feet).....	(1)	204,807		10,032		Percent
Value (\$1,000).....	\$ 165,000	4,529	\$ 160,474	911	\$ 161,003	6.3
Unit value (cents per linear foot).....		2.2		5.3		
Persons employed (number).....	28,800					

1 Not available.
 2 Estimated cost of producing motion pictures in the United States in 1939.
 3 Estimated landed value; foreign value was \$450,000.
 4 Estimated.
 5 Unit values of imported films (foreign values) are higher than that of exports because many foreign films are purchased outright by United States concerns, whereas exports are usually leased.

The films here under consideration are motion-picture films consisting of feature, news, and short-subject films, and special films for industrial or educational purposes. An exposed negative is an undeveloped exposed film. After negatives are developed, they are cut, edited, and are combined with parts of other negative film into what is known as a master negative. From master negatives positives are printed, a great number of positives usually being printed from a single master negative. Positives are the films used for final projection upon screens. In 1939 about 90 percent of the imports under these classes were positive films. The principal sources of imports were Japan, the United Kingdom, Italy, France, and the Soviet Union.

In recent years over 2 billion linear feet of raw film (see section on raw film and dry plates) have been used annually in the United States in making motion pictures, and in 1939 it is estimated that the cost of producing these picture films was about 165 million dollars. It is further estimated that about 480 feature films were produced in the United States in 1939 and that 278 foreign features were released in the United States. Foreign film showings are for the most part restricted to the very large cities where large numbers of foreign-born are located, whereas domestic films are distributed widely throughout the entire United States.

Motion-picture films are generally not produced for sale but are leased to motion-picture theaters in return for a percentage of the theater receipts or are shown in theaters owned by the producers of films or affiliated circuit theaters. Because of this rental practice it is quite evident that it would be impossible to assign precise values to production, imports, and exports. The values given in the report are more or less nominal.

Out of a total of about 17,000 motion-picture theaters in the United States, motion-picture producers or distributors own or control about 2,300, comprising most of the large first-run theaters. Another 4,100 theaters are controlled by independent circuits. All independents, including the independent circuits, are almost completely dependent upon the large motion-picture producers for the films they show. There is no other source to which they can go to obtain the proper variety and number of pictures. In addition to direct ownership or control of distribution channels by producers, block booking is a practice that has been widely adopted by the majority of United States producers, which, in effect, gives them an indirect control over exhibitors. Block booking means that exhibitors agree to take a certain number of pictures in a given period but they are given only limited power of selection. Thus it can be seen that through these means (i.e., either outright ownership or control, or block booking) domestic producers are able to exercise considerable control over the kinds of pictures shown in the United States. Although the principal types of motion pictures are those used for entertainment and for the dissemination of news, increasing numbers are being used for educational and industrial purposes.

The annual output of feature films has varied only slightly in the last decade; the number of motion-picture theaters has declined slightly since 1932. It may be assumed that the volume of production and consumption of motion-picture films after the war will probably not vary significantly from what they were in 1939, unless there should be a large increase in national income. There might, however, be some increase in production and consumption of "shorts" and educational and industrial films. Even if domestic consumption does not change materially, total production may increase to some extent because of greater export demand.

POST-WAR SHORT TERM

The trend of imports was generally upward in the decade before the war. Formerly, imported films were used largely in motion-picture theaters catering to the foreign-born population in the United States, but the improvement of foreign films during late years and Americans' increased interest in them may be continued and even augmented when the war is over.

POST-WAR LONG TERM

Consumption, Production, and Imports

A decrease in duty might possibly tend to increase imports slightly but would probably have little effect on United States production. Over-all "consumption" would therefore be only slightly greater than

if duties were not reduced by 50 percent (the increase being chiefly among certain population groups containing large numbers of foreign-born); and would be only slightly smaller if duties were increased by 50 percent. The differences in imports under the various duty assumptions would probably be so slight that separate estimates are not warranted even for imports, still less for consumption. The following estimates are made on the assumption that any indirect effects upon imports which may have resulted in the past from the controls exercised by the domestic motion picture producers will continue to be felt in the future. Otherwise the estimates might have to be altered, though to what extent would be uncertain.

Per capita income at 1939 level.

Imports might be as much as 25 percent larger than they were in 1939 for the reason (apart from increasing population) that more foreign pictures might be brought in for exhibition in theaters other than those catering to the foreign population. Imports then might amount to about 13 million linear feet, the foreign value of which, at 1939 prices, would approximate slightly less than \$700,000. The value (cost) of production for the domestic market might amount to 160-175 million dollars.

Per capita income 75 percent higher than in 1939.

The volume of imports might be as much as 17 million linear feet, the foreign value of which, at somewhat higher prices, might be more than 1 million dollars. The value (cost) of production for the domestic market, at somewhat higher prices (15 percent higher), might amount to 185-200 million dollars.

Exports

In pre-war years impediments in the form of quotas, taxes, and numerous other limitations were imposed by various foreign countries against United States motion-picture films. Despite these, United States exports of motion pictures were quite substantial. If the United States motion-picture industry maintains its reputation throughout the world and if there should be a tendency throughout the world to lessen the restrictions against United States motion pictures, exports from the United States might be as much as 25 percent greater than in 1939, and amount to more than 5 million dollars. With a higher level of world income than that prevailing around 1939, exports might be considerably above this level.

Employment

The number of persons employed has remained and probably will remain fairly uniform. In the post-war period the number might be in the general neighborhood of 30,000.

BRIER TOBACCO PIPES AND BRIER BLOCK

Tariff para- graph	Commodity	Rate of duty	Equivalent ad valorem (1939)
1552	Tobacco pipes, with bowls in chief value of briar wood:		
	Valued at less than \$1.20 per doz.	2½¢ ea. + 40%	77%
	Valued at \$1.20 or more, but not more than \$5 per doz.	5¢ ea. + 50%	78%
	Valued at more than \$5 per doz.	2½¢ ea. + 40%	48%
403	Briar block	10% ad val.	10%
	Average		26%

NOTE.—Tobacco pipes with briar wood bowls were made dutiable in the Tariff Act of 1930 at the rate of 5 cents each plus 60 percent ad valorem, regardless of value. The rate on wholly finished pipes valued at less than \$1.20 per dozen was reduced to 2½ cents each plus 40 percent ad valorem, effective June 16, 1930, pursuant to the trade agreement with France; those not wholly finished and in this value bracket, as well as all briar pipes valued at more than \$5 per dozen, became subject to the same rate, effective January 1, 1930, pursuant to the United Kingdom agreement. Briar pipes valued at \$1.20 or more, but not more than \$5, per dozen have been subject to a rate of 5 cents each plus 50 percent since January 1, 1929, pursuant to the United Kingdom agreement.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Briar pipes:						Percent
Quantity (1,000)	25,200	728	24,472	1,103	25,575	4
Value (\$1,000)	6,425	100	6,325	328		
Briar block:						100
Quantity (1,000)				36,903	36,903	
Value (\$1,000)				616		
Unit value (each)				\$0.016		

¹ Estimated from value shown in Census of Manufactures at 25 cents each.

² Pipes of all materials but believed to be mostly cheap briar.

³ Foreign value.

Briar blocks are used in making briar tobacco pipes, and cigar and cigarette holders. The great bulk of the blocks are made into pipes. As no briar is grown in the United States, it may be assumed that a briar block is imported for every briar pipe made in this country. In the past when imported briar has not been available in the United States, a variety of domestic woods have been substituted for it. However, as soon as briar has become available, the use of the domestic woods has been discontinued. Imports of briar blocks in 1939 were about 25 percent greater than domestic requirements in that year; the excess was intended to provide for a period when imports would be curtailed or stopped entirely by the war.

In 1939 about 96 percent of all briar pipes used in the United States were made from imported blocks and about 4 percent were imported as finished pipes. Imports for the most part consist of higher grade pipes than the bulk of United States production. Imported pipes come principally from the United Kingdom and France and imports of briar blocks come chiefly from Italy.

POST-WAR SHORT TERM

The consumption of pipes may be expected to be slightly above the 1939 level. Imports of pipes and of brier blocks will probably be about the same as in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Changes in duties would have little effect on consumption of pipes, but might affect materially consumption of brier blocks in this country and consequently the imports of blocks.

Per capita income at 1939 level.

Consumption of pipes probably will be in the neighborhood of 28 million or about 10 percent above the 1939 consumption because of the increase in population.

Duty as in 1939.—With the 1939 duties in effect, imports of pipes might be expected to furnish about the same proportion of consumption as they did in 1939 and amount to about 1.2 million pipes, with a foreign value of about \$360,000. This would indicate a production of brier pipes for the domestic market of about 26.8 million pipes and imports of an equal number of brier blocks. The value of the domestic production of pipes (including small exports) would probably be in the neighborhood of 6.7 million dollars and the foreign value of the imported blocks would be about \$428,000.

Duty reduced by 50 percent.—Lower duties would probably result in the importation of a larger number of pipes; this would in turn result in the production of a somewhat smaller number of pipes in this country and the importation of a correspondingly smaller number of blocks. Imports of pipes might supply as much as 7 percent of domestic consumption and amount to about 2 million, with a foreign value of about \$600,000. Production of pipes would then amount to about 26 million pipes and about that number of blocks would have to be imported. The value of the domestically produced pipes might be in the neighborhood of 6.5 million dollars and the foreign value of the imported blocks might be about \$416,000.

Duty increased by 50 percent.—An increase in duty would tend to restrict imports of pipes and result in a larger domestic production of pipes and a correspondingly larger importation of blocks. Imports of pipes then might amount to about 1 million with a foreign value of about \$300,000. This would imply a domestic production of about 27 million pipes and imports of about the same number of blocks. The value of the production of pipes would probably be about 7 million dollars and the foreign value of the imported blocks would be about \$432,000.

Per capita income 75 percent higher than in 1939.

Under a higher national income consumption might be 6–8 percent greater, in number, than with income as in 1939 and amount to about 30 million pipes. Prices of pipes might increase to about the same extent as the general price level and a larger proportion of the imports would be high-priced pipes. The average unit value of imports of pipes would thus be considerably higher than in periods when the national income was on a lower level. Prices of brier blocks would probably rise somewhat.

Duty as in 1939.—Imported pipes might supply 5 percent of consumption and amount to about 1½ million pipes, the foreign value of which, at increased prices, would be in the neighborhood of \$600,000. Domestic production would amount to 28½ million pipes, valued at about 8.2 million dollars, necessitating the importation of an equal number of blocks which would have a foreign value of about \$650,000.

Duty reduced by 50 percent.—Imported pipes might supply as much as 10 percent of domestic consumption or about 3 million pipes with a foreign value at increased prices of about 1.2 million dollars. Production of pipes for domestic consumption would thus be about 27 million pipes, which would be valued at about 7.8 million dollars. Imports of blocks (about 27 million) would have a foreign value, at increased prices, of about \$600,000.

Duty increased by 50 percent.—Imports of pipes would probably not exceed 1 million with a foreign value at increased prices of about \$400,000. United States production for domestic consumption would then be about 29 million pipes valued at about 8½ million dollars. Imported blocks (about 29 million) would have a foreign value at increased prices of nearly \$650,000.

Exports

Exports of brier pipes are not separately classified; however, they are known to have been small in 1939 and it is assumed that they will not increase significantly in the post-war world.

Employment

About 95 percent of the industry manufacturing pipes, cigar and cigarette holders is devoted to the manufacture of brier pipes. In 1939 the average number of all employees of the industry was 2,481, of which 2,400 are estimated to have been employed in the production of brier pipes. It is not expected that employment will increase in the short-term period, but in the long term it may reach 3,000.

CIGARETTE PAPER

Tariff paragraph: 1552.

Commodity: Cigarette paper in bobbins, sheets, and booklets.

Rate of duty: 45% ad val.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Reserve stock	Ratio of imports to consumption
	Total ¹	For export ¹	For domestic market				
Quantity (1,000 pounds).....	17,000	5,600	11,400	16,856	22,734	5,822	Percent 74
Value (\$1,000).....	5,600	1,850	3,750	3,922	1,722		
Unit value (per pound).....	\$0.33	\$0.33		\$0.23			
Persons employed (number).....	1,600						

¹ Estimated.

² Foreign value.

For many years the consumption of cigarette paper in the United States has been growing rapidly. From 1930 to 1940 the average annual rate of increase was about 5 percent; from 1941 to 1944 the annual rate of increase rose to about 10 percent because of lend-lease shipments and the large quantities of cigarettes used by our armed forces.

Consumption of cigarette paper in 1943 was approximately 45 percent larger than in 1939.

Previous to 1940, France was the source of over 95 percent of the United States imports of cigarette paper, and a considerable part of these imports originated in mills in which cigarette manufacturers in this country had a substantial interest. The French paper was made from high-grade linen rags. Imports declined after 1939 and by 1944 had practically ceased. Immediately following the beginning of the war United States production, mainly in a plant projected some time before, increased sufficiently not only to supply domestic requirements but to build up a large reserve stock and a large export trade.

The large North Carolina mill which started production in 1939 was financed in part by domestic cigarette manufacturers, who were interested in making themselves independent of foreign sources of supply. This mill uses as material the fiber from seed flax straw, of which there is a practically unlimited domestic supply. The mill is capable of supplying the total domestic requirement for cigarette paper at a price no higher than, and possibly as much as 10 percent below, the 1939 price. For all these reasons it is improbable that imports will again attain anything like the former levels, and they may fail almost entirely to be revived.

Cigarette paper is marketed in two forms, namely, bobbins for use on cigarette-making machines and booklets for the use of those who roll their own cigarettes. The bobbins represent from 80 to 90 percent of the total United States consumption. Both forms are made from identical raw material.

Variations in per capita income, unless they are drastically downward, have only moderate effect on the per capita consumption of cigarettes, and, therefore, of cigarette paper. Inasmuch as the cost of cigarette paper is less than 1 percent of the price of the cigarette, the cost of the paper alone has little or no influence on the volume of this paper consumed.

POST-WAR SHORT TERM

Although the consumption of cigarette paper during the two or three years immediately following the war is likely to be less than during the war, it will probably be considerably higher than in 1939. For reasons previously noted, domestic production may supply practically the entire domestic demand and imports may be small. Exports may be substantially above those of 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Although the average annual rate of increase of cigarette paper consumption was about 5 percent during the decade before 1940, the rate of increase was becoming lower during the later years of that period. Assuming that the leveling off of the upward trend is continued after the war, the annual consumption in the long-run period would probably be about 28 million pounds. For reasons mentioned above, prices may be as much as 10 percent below those of 1939, so that the total value of consumption might be about 9 million dollars. If exports are maintained substantially above pre-war levels, domestic production might be about 38 million pounds, with a value of approximately 12 million dollars.

Imports would probably be small in comparison with those formerly brought in, and might be confined almost wholly to quantities imported for use in the production of specialty lines of cigarettes. It seems most likely that imports would not exceed 100-200 thousand pounds, with a foreign value of \$25,000-\$45,000, although they might possibly be several times larger. It is unlikely that the quantity imported would be affected greatly by changes of 50 percent in duty.

Per capita income 75 percent higher than in 1939.

Consumption of cigarette paper would likely be about 10 percent above that at the lower income level, or about 31 million pounds. It is unlikely that the competitive relationship of imported and domestic paper would be altered by the change in income. Prices, however, might be the same as in 1939 or 10 percent above that level. Thus total value of consumption would be 10-11 million dollars. Assuming exports to be about 11 million pounds, domestic production would be about 42 million pounds, with a value of about 15 million dollars, and that of imports from \$25,000 to \$50,000 (foreign value).

Exports

Exports of cigarette paper are likely to remain from 50 to 100 percent greater than in 1939 but from 20 to 40 percent less than in 1943. They may amount in the long-term period to 8.5-11.0 million pounds valued at 3-4 million dollars. Exports will go largely to markets in the Western Hemisphere supplied by the United States during the war period, when European paper was not available.

Employment

In 1939 most of the persons employed in making cigarette paper were also engaged in making other types of thin paper in the same mills. Assuming that in the long-term period these persons would be engaged full time in the production of cigarette paper, it would probably require about 2,000 employees for an output of 40-45 million pounds.

FUR AND PRESS CLOTH WASTE*Tariff paragraph:* 1555.*Commodity:* Press cloth waste; fur pieces or trimmings with fur on the skin; fur felt scrap, roundings, parings, and similar hatters' waste.*Rate of duty:* 7½% ad val.

NOTE.—The commodities covered by this report are dutiable as waste, not specially provided for, on which a duty of 10 percent ad valorem was imposed by the Tariff Act of 1930. The rate was reduced to 7½ percent, effective January 1, 1939, pursuant to trade agreements with Canada and the United Kingdom.

GENERAL

United States imports of these commodities in 1939 were valued at \$376,000. They include wool press cloth waste;¹ fur pieces or trimmings with fur on the skin; fur belt scrap, roundings, parings, and similar hatters' waste. The amount of wool, fur, and fur felt waste collected in the United States is known to be large, but there is no basis for estimating the amount produced or consumed. Statistics on exports of the three classes here considered are not available, although it is known that substantial quantities of fur pieces and damaged fur skins have been exported.

Fur waste, consisting of small pieces of fur too small to be sewed together for use in making wearing apparel, is used in making a low-grade hatters' fur, and the waste consisting of scrap obtained from making fur felt hats is used principally as fertilizer. Press cloth waste, pieces larger than 12 x 24 inches, is used in making wool shoddy. The material obtained from press cloth waste comprises a very small part of the total that is used in making shoddy. The prices of these materials, which are not quoted on any market, are determined very largely by the availability and the prices of new materials and other substitute materials that could be used for the same purpose. Prices are not usually subject to wide variations, unless new developments affecting materials occur or national income changes significantly.

POST-WAR SHORT TERM

Imports immediately following the war may be about the same as in 1939.

POST-WAR LONG TERM*Per capita income at 1939 level.*

Regardless of national income, an increase or decrease in the duty would probably have little effect upon imports. Per capita consumption of fur and press cloth waste would probably be about the same as in 1939; allowing for an increase in population, the foreign value of imports might amount to about \$400,000.

Per capita income 75 percent higher than 1939.

More waste would be available under a higher income than under a lower income. The foreign value of imports might amount to about \$500,000.

¹ Pieces larger than 12 x 24 inches. Smaller pieces are dutiable as wool waste and are covered by separate statement (see section on wool rag waste).

CHRISTMAS TREES

Tariff paragraph: 1558.

Commodity: Christmas trees, evergreen.

Rate of duty: 5%.

NOTE.—The rate fixed in the Tariff Act of 1930 was 10 percent ad valorem, which was reduced to 5 percent, effective January 1, 1939, pursuant to trade agreement with Canada.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Total production ¹	Imports	Apparent consumption	Ratio of imports to consumption
Quantity (1,000 trees).....	6,000	4,644	10,644	Percent 44
Value (\$1,000).....	1,500	\$537		
Unit value (per tree).....	\$0.25	\$0.12		
Persons employed.....	(²)			

¹ Estimated; production for export and for the domestic market are not available.

² Foreign value.

³ Persons employed, for a very short time each year, may number 40,000 or more.

The production and sale of Christmas trees is a seasonal industry of considerable proportions. Metropolitan areas are supplied chiefly by commercial dealers, whereas in rural areas most of the sales are made direct from farmers and forest landowners to individuals or to local stores and distributors. Domestic production includes a wide variety of tree species, although balsam fir and spruce predominate in the northern and eastern markets, and Douglas fir in the West. Pine and cedar are used to a large extent in the South. From one-third to one-half of the total consumption is supplied by imports from Canada, of which about 60 percent consists of balsam fir, 25 percent of spruce, and 10 percent of Douglas fir.

Regular production of Christmas trees as a cash crop was not, until recently, widespread in the United States. However, production of these trees is now being encouraged in many sections and a rapid expansion of output is possible. Proportionate expansion of the Canadian operations is not to be expected, as many of the more favorable producing areas in Canada are already being methodically exploited.

Because much of the production is on a small scale and is widely scattered, and because a large part of the market is relatively unorganized, accurate data on the prices received by the producers are not available. The relatively low unit value of imported trees may possibly be accounted for by the considerable proportion of small "table model" trees 2 to 3 feet high which are included.

POST-WAR SHORT TERM

The Christmas tree industry has grown rapidly in recent years. Through the development of a more efficient distribution system, trees have been made available to an increasing number of families, and it is probable that consumption will be much greater in the immediate post-war years than in 1939. A larger proportion than formerly will

likely be supplied by domestic production, although imports will probably show a substantial increase in quantity. The average price of trees might be materially higher, and the value of production and imports considerably greater, than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at the 1939 level.

The recent gains in the use of Christmas trees will probably be sustained, so that consumption is likely to be higher than in 1939, and might total 12-16 million trees. Production is likely to be at least 50 percent greater than in 1939, or, say, about 9 million trees, of a value of about \$2,250,000. Imports may be around 10 percent greater, or say 5 million trees, valued at \$580,000 (foreign value), prices probably remaining about as in 1939. As the rate of duty is very small, it is not likely that the changes of 50 percent in either direction would affect the amounts imported, produced, or consumed.

Per capita income 75 percent higher than in 1939.

At this level of income a consumption of 18-20 million trees might be reached. Production would perhaps be twice that in 1939, or about 12 million trees. The average price of trees might be 15 percent higher than in 1939, which would give an estimated value of \$3,450,000. Imports might increase 50 percent and reach a total of about 7 million trees, with a foreign value of \$935,000 (75 percent greater than the 1939 value).

Exports

United States statistics do not show separately the exports of Christmas trees; such exports are negligible.

Employment

No data are available concerning the number of persons engaged in the production of Christmas trees, but possibly 40,000 to 50,000 workers are employed for a short period each year.

CORK (RAW)

Tariff paragraph: 1661.

Commodity: Cork wood or bark, unmanufactured.
Cork waste, shavings, and refuse (incl. virgin cork).

Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 pounds)-----	228, 000
Value (\$1,000)-----	1 4, 100
Unit value (per pound)-----	\$0. 018

¹ Foreign value.

All the raw cork consumed in the United States is obtained from imported materials either in the form of wood or bark, part of which becomes waste and is used over again, or in the form of imported waste. Thus, since reexports of raw cork are negligible, imports ap-

proximate primary consumption. There is, however, a substantial production in the United States of cork waste and shavings which result from the manufacture of cork products and which is used further in manufacturing certain other cork products. Statistics are not available showing domestic production of cork waste or shavings. Of the imports of raw cork, about two-thirds to three-fourths is in the form of waste, shavings, or refuse, and the remainder is wood or bark.

In 1939 imports of raw cork were about 10 percent above the average of the years 1936-38. Undoubtedly part of this increase represented an accumulation of stocks in anticipation of probable shortages caused by the war in Europe. Imports have come principally from Portugal, Spain, and Algeria.

POST-WAR SHORT TERM

Wartime restrictions in building and on consumers' goods employing cork have resulted in a decline in the consumption of cork for consumers' uses. With the removal of such restrictions and with ample quantities available from abroad, it may be expected that in the first few years after the war the consumption of cork for building and construction and consumers' goods will increase materially over pre-war levels.

POST-WAR LONG TERM

In recent years a number of substitute materials have been developed that have proved satisfactory in many products formerly made of cork. In addition, there are natural limitations on the production of cork. Cork forests throughout the world are of natural growth rather than cultivated and are subject to loss resulting from fire, wind, and other forms of destruction. This would probably tend to limit the possible increase in consumption, even under a large increase in national income.

Per capita income at 1939 level.

Although it is possible that the per capita consumption of cork would decrease below the pre-war average, the total consumption, allowing for an increase of 10 percent in population, might nevertheless be about equal to 1939 imports of 228 million pounds. The foreign value of imports would probably be about 4 million dollars.

Per capita income 75 percent higher than in 1939.

Under a higher per capita income, the consumption of raw cork might conceivably be about 10-15 percent greater than with no change and might amount to 250-275 million pounds with a foreign value, at the increased price level, of 5.0-5.5 million dollars.

INDUSTRIAL DIAMONDS

Tariff paragraph: 1668.

Commodity: Diamonds; glaziers' and engravers', unset; and miners' (including bort).

Rate of duty: Free.

GENERAL

Data on United States imports (apparent consumption) for 1939 are given below:

Quantity (1,000 carats)	3,569
Value (\$1,000)	19,726

¹ Foreign value.

Industrial diamonds are a strategic commodity essential to both wartime and peacetime industry. They are used principally in engineering, industrial, and mining enterprises in the form of diamond-bonded grinding wheels, diamond-tipped tools for truing and dressing grinding wheels, diamond drill bits, diamond dies for drawing fine wire, and in shaped diamond tools. For certain industrial purposes there is no substitute for diamonds; in some other applications the use of a substitute results in greatly increased production costs.

Consumption of industrial diamonds in the United States increased greatly during the decade preceding the war. Estimated consumption amounted to less than 50,000 carats in 1929 and increased to about 3.6 million carats in 1939. The average annual imports for the 4 years 1936-39 were about 2 million carats, valued at 6.2 million dollars. The very great increase in the use of industrial diamonds during the present war, to more than 10 million carats in 1943, was caused by the marked expansion in industry and the necessity for volume production and extreme precision.

Total world production of rough diamonds (including both gem and industrial qualities) reached a high point in 1933 of 13 million carats, and declined in 1941 and in 1942 to 9 million carats, and in 1943 to 8 million carats. More than three-fourths of these diamonds, in terms of carats, are used for industrial purposes (the proportion in terms of value is of course far smaller). Current world consumption of industrial diamonds is estimated to be more than twice as great as production, and supplies are being drawn from stocks previously accumulated by the diamond syndicate. It is understood, however, that these stocks are nearing exhaustion.

About 95 percent of the world's supply of rough diamonds (industrial and gem) is produced in Africa. Most of the remainder is produced in Brazil and Venezuela. Industrial and gem stones are mined together; those that are flawed or off-color are sold for industrial purposes, and those that are of gem quality are sold as "cuttables". The production and sale of virtually all the African diamonds are under strict control of a cartel. The control of industrial diamonds is not expressly included in the cartel agreement; but inasmuch as industrial and gem stones are mined together, a limitation on the production of gem diamonds limits the production of both. Furthermore, the sales of virtually all the rough stones produced in Africa (including industrial diamonds) are channeled through the selling agency of the diamond syndicate, The Diamond Trading Company, which has offices in both London and Kimberley.

Production could be expanded considerably in certain alluvial areas (principally the Belgian Congo) in which more than 95 percent of the output is of industrial quality, with only a negligible increase in the production of gem diamonds. The supply of industrial diamonds could also be increased, if demand and prices offered sufficient incentive, by the diversion of borderline material from the cuttable market to industry.

POST-WAR SHORT TERM

During the war new uses and new methods of application for industrial diamonds have been developed, and industry has become more widely acquainted with the results that can be achieved from their use. Although consumption of industrial diamonds in the immediate post-war period may be smaller than wartime requirements, it will

doubtless be far in excess of pre-war consumption. Prices also may be expected to be considerably above the pre-war level. The value of imports therefore will doubtless be much greater than before the war.

POST-WAR LONG TERM

The estimates of imports in the long term are based on the assumptions that the use of diamonds in industry will continue to increase more rapidly than total industrial production; that the level of production of diamonds will be higher than the wartime level; that more than three-fourths of the diamonds produced will be of industrial quality; that any increase in demand over a short period will be met from reserve supplies; that more than three-fourths of the industrial diamonds consumed will consist of crushing bort. (which is the poorest quality of industrial diamond and is much lower in price than other types); that the price of industrial diamonds will increase at a more rapid rate than the general price level; that no substitute for diamonds will be available; and that the diamond deposits now being worked will represent the only important sources of supply. It is further assumed that the level of imports, which might otherwise conform generally to that of domestic industrial activity, will be limited by factors of supply and price, particularly as these may be affected by the existence and policies of the diamond syndicate.

Per capita income at 1939 level.

Imports of industrial diamonds might amount to 7 million carats, valued at about 20 million dollars, foreign value, or about double the 1939 figures and nearly 4 times the average for 1936-39.

Per capita income 75 percent higher than in 1939.

Imports of industrial diamonds might be within the range of 9-12 million carats, valued from 25-40 million dollars, foreign value; the quantity used being estimated as from 30 to 70 percent greater than with income as in 1939, whereas the average prices may be either about the same as, or considerably higher than, at that income level.

FURS (EXCEPT SILVER FOX), UNDRESSED

Tariff paragraph: 1681.

Commodity: Furs and fur skins, not specially provided for, undressed.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports (less re- exports) ¹	Apparent consump- tion	Ratio of imports to con- sumption
	Total	For export ²	For domestic market			
Value (\$1,000).....	\$ 50,000	9,326	\$ 40,674	\$ 50,000	\$ 90,674	Percent 55

¹ Exports in 1939 were about 30 percent less than the average in 1936-38.

² Imports in 1939 were about 20 percent less than the average in 1936-38.

³ Estimated.

⁴ Landed value; foreign value was \$47,549.

NOTE.—The relatively low exports and imports in 1939 may be attributed largely to unsettled market conditions resulting from preparations for and the actual outbreak of the war.

Undressed furs are raw fur skins that have not undergone the necessary preparatory treatment before they are suitable for manufacture into wearing apparel or other articles. The principal varieties of imported furs considered here are Persian lamb, coney or rabbit, fox (other than silver), mink, marten, lamb and sheep (other than Persian lamb or caracul), weasel, kolinski, hare, squirrel, fitch, marmot, and beaver. Of the foregoing, only mink, fox, and beaver are produced in the United States in significant quantities. Other kinds of furs produced in the United States in large numbers are muskrat, skunk, opossum, Alaska seal, raccoon, and wolf; imports of these kinds are relatively small. The bulk of world supply is procured from trapped animals but large quantities of mink and Persian lamb furs are taken from animals raised on farms, and a substantial part of the supply of coney or rabbit skins is taken from domesticated rabbits raised for meat.

All undressed furs must be dressed or dressed and dyed before they can be used. With the exception of coney or rabbit and hare skins, used in about equal quantities in the making of fur felt hats and fur goods, virtually the entire supply of furs is used for coats or coat trimmings, wraps, and neckpieces.

The United States is the world's largest producer and consumer of furs. Imports come principally from the Soviet Union, China, Canada, Afghanistan, South Africa, France, and Australia. Many kinds are imported from the Soviet Union, China, and Canada, but imports from Afghanistan and South Africa consist mostly of Persian lamb furs, and those from France and Australia principally of coney or rabbit skins.

Most furs are considered to be luxuries and consumption usually follows the trend of national income; prices fluctuate to a greater degree than the average of the prices of all commodities. In pre-war years undressed furs were sold principally through dealers and at auction in New York and London, a large part of the quantity sold in London being reexported to continental Europe and the United States. There are virtually no restrictions on their movement in international trade. Selling as they do largely in different price ranges and being subject to varying consumer preference, the various kinds of furs are competitive only within rather narrow limits; in the highly organized world fur market the demand for given kinds can usually be fulfilled. Potential world supply is not known but it is probably much greater than the amount that has ever been placed on the market in any year. High levels of national income and high prices usually bring increased quantities to market, particularly from nonindustrialized countries. Domestic production of undressed furs might also be expected to rise when the national income is high, though probably not to the same extent as imports, because part-time trappers, who ordinarily procure most of the domestic supply, might, at such times, shift to more lucrative employment.

POST-WAR SHORT TERM

Consumption of undressed furs in the immediate post-war years will probably be much larger than in 1939 especially if purchasing power in the United States remains high and that in European countries remains low. Domestic production will probably be at a high level because part-time trappers and farmers, now in the armed

forces or working in war plants, will have again become engaged in trapping fur-bearing animals. The value of imports in the immediate post-war period will probably be much greater than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption of furs in 1939 was about 20 percent under the average of 1936-38, in spite of a somewhat higher national income in 1939. It might therefore be expected that per capita consumption, with national income at the 1939 level, would be about 25 percent more than in 1939. Allowing for an increase of 10 percent in population, total consumption therefore might increase by about 37½ percent, amounting to about 125 million dollars at 1939 prices. Both domestic production and imports would probably increase by about 37½ percent. Apart from probable exports, production for the domestic market would then be valued at about 55 million dollars (about 45 percent of consumption) and the landed value of imports would be about 70 million dollars (about 65 million dollars foreign value).

Per capita income 75 percent higher than in 1939.

This level of income, if maintained for some years, might cause an increase of 30 percent in the quantity of furs consumed in the United States and of about 70 percent in fur prices, compared with consumption and prices at the lower income level. The value of consumption might be about 275 million dollars. United States production of furs under a high level of income might increase less than production in nonindustrialized countries. Domestic production then might account for about 40 percent of consumption instead of 45 percent as under the 1939 income level. Production for the domestic market would probably be valued at 110 million dollars and the landed value of imports would be about 165 million dollars (about 157 million dollars foreign value).

Exports

In the short-term period, exports may not be valued at more than 1-3 million dollars a year, slightly above the 1943 level. Countries, particularly European countries, that were previously important consumers of furs will probably not be in a position to take furs at the pre-war rate. Over the long term, imports and exports may hold the same relationship as in 1939 if the per capita income is at 1939 levels, in which case exports would be worth about 12 million dollars. Should incomes throughout the world reach a level substantially higher than in 1939, exports might be valued at as much as 20 million dollars.

Employment

Though official statistics of employment are not available, it is known that large numbers of people are engaged on a part-time basis in trapping and collecting fur-bearing animals and in raising them on farms and ranches. Part-time employment would probably increase under a high national income though probably not in direct proportion to the increase in income.

HORSE MANE AND TAIL HAIR, RAW AND DRAWN

Tariff paragraph: 1688.

Commodity: Horse mane and tail hair, raw (including switches) and drawn.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export (includes reexports)	For domestic market			
Quantity (1,000 pounds).....	1 960	1 490	400	2 472	2 962	Percent 83
Value (\$1,000).....	1 560	1 790	790	1 995		
Unit value (per pound).....	\$1.61	\$1.61	\$1.61	\$0.40		
Persons employed (number).....	100					

1 Estimated.

2 Foreign value.

Raw horse mane and tail hair is the hair as it is taken from the animal. Drawn or dressed hair is that which has been thoroughly cleaned, sterilized, combed to parallel the hairs, sorted according to length, and bound in bundles of about 2 inches in diameter. In 1939, about twice as much drawn hair was imported as raw. Most mane hair and all tail hair which is unsuitable for drawing (about 10 percent) is curled and used for upholstery and mattress filling. The remainder of the tail hair, all of which is dressed, is used in making household and industrial brushes (80 percent) and in making interlinings (20 percent). Before the war, goat hair was displacing horsehair to a large extent in the manufacture of interlinings. It is expected that very little horsehair will be used for this purpose after the war. Thus, more horsehair of better quality will be available for brush making. The amount of horsehair that will be used in the manufacture of paint and varnish brushes after the war will depend not only on the demand for such brushes but on the prices of competitive raw materials such as bristles and nylon.

Only a small part of the United States consumption of horsehair has been produced in this country and it is not expected that domestic production will increase materially after the war. In 1939 and earlier years, Argentina was the principal source of imports of raw horsehair and China the leading supplier of dressed horsehair. Small amounts were also obtained from Mexico, Canada, the Soviet Union, and Brazil.

POST-WAR SHORT TERM

It is estimated that consumption, and hence imports, in the immediate post-war years will be materially higher than in 1939, because of assumed high purchasing power.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Allowing for a 10-percent increase in population, the consumption of horsehair might amount to as much as 3.2 million pounds. Imports, which are likely to supply a large part of consumption, might amount to about 2½ million pounds, with a foreign value of about 1 million dollars. Production for the domestic market might amount to about 700,000 pounds valued at 1.1 million dollars.

Per capita income 75 percent higher than in 1939.

Under these conditions the consumption of horsehair might increase to a level of about 4½ million pounds, an increase of about 50 percent over that of 1939. Imports would probably supply about 3½ million pounds, the foreign value of which, at increased prices, would be about 2 million dollars. Production for the domestic market would be about 1 million pounds, with a value at increased prices of about 1.7 million dollars.

Exports

At the 1939 income level, exports, in the long-term period, might amount to about 500,000 pounds, valued at about \$250,000. At higher income levels exports might amount to as much as 750,000 pounds, valued, at increased prices, at about \$400,000.

Employment

Information, relative to employment in this industry, is not available.

CATTLE AND HORSE BODY HAIR

Tariff paragraph: 1688.

Commodity: Cattle, ox, calf, and horse body hair, except ear hair.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production			Imports	Estimated consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 48,127	5,062	43,065	2,311	46,376	Percent 7
Value (\$1,000).....	2,166	411	1,755	278		
Unit value (per pound).....	4.5¢	8.1¢	4.1¢	8.4¢		

1 Estimated.
2 Foreign value.

The term "animal body hair" will be used to refer to both cattle and horse body hair covered by this report. About 99 percent of the total consists of cattle hair. Animal body hair is largely a byproduct of the tanning industry and the volume of production depends upon

the quantity of hides that are tanned. In 1939 and earlier years, imports formed usually less than 10 percent of total consumption and never more than 13 percent.

More than 88 percent of the animal body hair consumed in the United States is used in the manufacture of hair felts, which are used principally for carpet and rug linings and cushions and for insulation. The greater part of the remainder is used in textiles. Imports in 1939 and earlier years came principally from Canada, Germany, the Soviet Union, and the United Kingdom.

POST-WAR SHORT TERM

Imports might be a little larger than in 1939, since consumption will probably be somewhat greater than in that year. There has, however, been no shortage of animal body hair during the war, and no great backlog of demand has been created for products made from animal body hair.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Consumption might be about 10 percent greater than in 1939 to allow for the increase in population, or about 50 million pounds. If imports maintain the same relationship to consumption as in 1939, they would amount to about 3½ million pounds, with a foreign value (at 1939 unit values) of about \$300,000. Production for the domestic market would probably be about 46.5 million pounds, valued at about 1.9 million dollars.

Per capita income 75 percent higher than in 1939.

Consumption might be as much as 45 percent greater than in 1939. This would allow for population increase, an increase in the demand for the products made from animal body hair resulting from higher income, and a moderate price increase (10 percent). Under this assumption, consumption might amount to as much as 70 million pounds. Imports might supply about 5 million pounds, with a foreign value of about \$475,000. Production, assuming a proportional increase in exports, would be about 72 million pounds, valued at about 3½ million dollars at increased price levels.

Exports

Exports are from 10 to 15 percent of production and usually slightly exceed imports. Exports generally consist of surpluses of certain grades while imports cover shortages of other grades. At income levels about the same as in 1939, exports might amount to 5½ million pounds, valued at \$445,000; at higher world income levels exports might amount to as much as 6½ million pounds, with a value of about \$600,000.

Employment

Information as to employment in this industry is not available.

GOAT AND KID HAIR

Tariff paragraph: 1688.

Commodity: Goat and kid hair except Angora (mohair) and Cashmere.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production		Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export			
Quantity (1,000 lb.).....	\$ 14,000	\$ 70	4,016	\$ 18,000	Percent 23
Value (\$1,000).....	\$ 2,100	\$ 10	\$ 448		
Unit value (per lb.).....	15¢	14¢	11¢		

¹ Arrived at by multiplying the number of goat and kid skins tanned by 0.364 pound, the average weight of hair per skin.

² Estimated.

³ Foreign value.

The hair of goats and kids, excluding the hair of Angora and Cashmere goats, is used principally in making felts, about 70 percent being used for this purpose. It is also used in making carpet yarns (20 percent), interlinings (5-10 percent), and brushes (about 2 percent). Goat and kid hair, in its various uses, is mixed with other materials such as wool, other animal hair, and rayon and vegetable fibers. The supply and price of these materials affects the consumption of goat and kid hair, as they are largely interchangeable with it.

Although the prices of goat and kid hair range from about 3 to 60 cents per pound, the great bulk of the hair sold in 1939 (a representative year) averaged about 15 cents per pound. On the basis of the past movement of animal-hair prices in relation to the general price level, it might be expected that with a 75-percent increase in national income the prices of goat and kid hair would increase in somewhat the same proportion as the general price level.

Approximately 80 percent of the quantity of goat and kid hair consumed in the United States is a byproduct of the domestic tanning industry. The volume of domestic production depends on the number of goat and kid skins tanned which, to a large extent, follows the trend of national income. Virtually the entire supply of goat and kid skins tanned in the United States is obtained from foreign sources.

Imported hair (almost entirely from India) is clipped from live goats or kids. Most of it is used in interlinings. This is one of the less important uses of goat and kid hair. The use of interlinings is not likely to change greatly and thus imports are not likely to become of relatively greater importance in consumption than in past years, when they have accounted for about 20 percent of the total.

Under the various assumptions made in this report, domestic production is based on the number of goat and kid skins that may be tanned (see section in this series on goat and kid skins), imports are estimated by assuming a continuance of their past relationship to consumption, and, inasmuch as the entire domestic production of goat and kid hair is usually fully utilized, consumption is obtained by adding probable imports to probable domestic production.

POST-WAR SHORT TERM

In this period there will probably be a small increase in consumption, production, and imports of goat and kid hair.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

Because of an expected increase in the per capita consumption of goat and kid skins for making leather, consumption of goat and kid hair, taking account of increase in population, may be in the general neighborhood of about 22 million pounds. Of this total, production might be expected to supply about 17 million pounds, valued (at 1939 prices) at about 2½ million dollars, and imports about 5 million pounds, with a foreign value of possibly \$500,000.

Per capita income 75 percent higher than in 1939.

With the increased United States consumption of goat and kid skins under the higher income level domestic consumption of goat and kid hair might be about 25 million pounds. Domestic production would probably be about 19 million pounds, valued (assuming some increase in prices) at a little more than 3 million dollars, and imports would be about 6 million pounds, with a foreign value of about \$700,000.

Exports

Exports of goat and kid hair were small in pre-war years and will probably be small in the post-war period.

Employment

The number of workers in the goat and kid skin tanning industry who remove and process the hair are not enumerated separately.

SCRAP RUBBER

Tariff paragraph: 1697.

Commodity: Scrap or refuse natural rubber fit only for remanufacture.

Rate of duty: Free.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production (collection)			Imports	Apparent consumption	Ratio of imports to consumption
	Total	For export	For domestic market			
Quantity (1,000 pounds).....	1 460,000	95,000	1 465,000	11,000	1 476,000	Percent 2.2
Value (\$1,000).....		1,585		1 300		
Unit value (cents per lb.).....		1.66		1.99		

¹ Estimated.
² Foreign value.

Scrap rubber is the raw material for the production of reclaimed rubber, which is used, generally with a much larger proportion of new rubber, in the production of a number of articles, including tires.

This report, however, does not cover reclaimed rubber as such, the imports of reclaimed rubber being very small. Reclaimed rubber includes about 45 percent of fillers, plasticizers and other materials, and about 55 percent of rubber. When used in moderate amounts, it facilitates the mixing and milling of new rubber, without lowering the quality of the articles made from the mixture. It is used alone to make only a few commodities, in which most of the qualities of rubber are not very important. Worn tires and tubes make up most of the scrap used, and the rubber reclaimed therefrom averages about 85 percent of the original weight of the scrap.

The United States, with by far the world's largest consumption of tires, has a much larger supply of scrap rubber than any other country. In peacetime only a part of the scrap available in this country is collected, and a considerable part of that is exported either as scrap or as reclaimed rubber, exports in both forms being substantial. In 1939 more scrap was collected in the United States, and more scrap and reclaimed rubber were shipped abroad, than in 1938 or most previous years. Japan took more than half the exports and Germany the next largest amount. United States imports of scrap are very small compared with the amounts collected or exported. Imports come principally from Canada and the United Kingdom.

The availability of synthetic rubber scrap has recently somewhat complicated the reclaiming of all kinds of rubber, since certain types of synthetic cannot be reclaimed along with natural or with other types of synthetic. Synthetic rubber is not as yet being reclaimed on a large scale and comparable costs are therefore not available. It has been found that reclaimed synthetic is more nearly like the new product than is reclaimed natural rubber.

POST-WAR SHORT TERM

It is probable that manufacturers of tires and other rubber articles will continue to use much reclaimed rubber, and that substantial amounts of scrap will be collected in the United States. There will probably be a large surplus of scrap rubber in some European and some other countries immediately after the war, even though they may reclaim much of it for their own use. It is possible that imports will be twice as large as in 1939, although still supplying only a small fraction of domestic consumption.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

It is anticipated that as soon as the far eastern rubber plantations come back into production on anything like their pre-war scale, thus greatly augmenting the vast supply of synthetic rubber produced in the United States and Europe, rubber prices may be considerably lower than they were just before the war. If so, this would tend to reduce the consumption of scrap and reclaimed rubber. Since, however, total consumption of rubber is likely, even with no increase in income, to be materially greater than before the war, it appears probable that consumption of scrap might be at least as large as before the war, or about 500 million pounds, if only because of its utility in mixing and milling new rubber.

The domestic supply of scrap rubber may be in excess of the requirements. Nevertheless, since supplies will also be large in foreign countries, United States imports might exceed the small 1939 figure, perhaps amounting to as much as 15 million pounds, valued, if prices are somewhat lower than before the war, at about \$250,000.

Per capita income 75 percent higher than in 1939.

A larger consumption of rubber goods, resulting from an increase in purchasing power, might well create a larger demand for reclaimed rubber than would exist with no change in income. If the amount of scrap used should increase in the same proportion as new rubber, which it might well do, consumption would probably amount to about 900 million pounds, and domestic collection might be somewhat higher, allowing for some exports. Imports might also increase substantially and amount to as much as 25-30 million pounds, with a value of about \$400,000 or more.

Exports

It is possible that fairly substantial quantities of reclaimed rubber will be exported to Europe and other countries during the immediate post-war period, but it is not probable that exports of scrap will be as large as before the war. Even during the 1950's there will probably be ample supplies of scrap rubber in most foreign markets. It is not probable that Japan or Germany, which in 1939 took more than 60 percent of United States exports of scrap, will purchase anywhere near the quantities they imported before the war.

Employment

It is impossible to ascertain the amount of labor going into the collection of scrap rubber. Employment in the reclaiming of rubber ranges from somewhat less than 3,500 to about 4,000.

RUBBER

Tariff paragraph	Commodity	Rate of duty
1558	Rubber, natural	Free.
1697	Rubber, synthetic	20% ad val.

GENERAL

Data on United States production, imports, and consumption for 1939 are given below:

Item	Production	Imports less re-exports ¹	Apparent consumption ²	Ratio of imports to consumption
Quantity (1,000 long tons)-----	12	487	499	Percent 99.6
Value (\$1,000)-----	\$ 2,500	\$ 175,000		
Unit value (cents per pound)-----	\$ 52	18		
Persons employed-----	(?)			

¹ Total imports 500,000 tons; reexports 13,000.
² "Apparent" consumption—net imports plus production. The larger actual consumption in 1939 was partly out of stocks.
³ Synthetic rubber.
⁴ Actual consumption amounted to 564,000 tons.
⁵ Estimated.
⁶ Foreign value.
⁷ Not available; very small.

The present report relates primarily to the post-war relationship between imports of crude natural rubber and domestic production of synthetic rubber. It does not include certain rubberlike commodities such as gutta percha, jelutong and balata, which are covered in separate sections. Likewise it does not cover reclaimed rubber, which has been and will probably continue to be an important adjunct of new rubber in the production of tires and other articles.¹ In the above table relating to 1939, domestic production represents a small output of synthetic rubber and an insignificant amount of guayule (a natural product).

Synthetic rubber is dutiable under paragraph 1558 (a basket paragraph covering all manufactured articles not specifically enumerated) at 20 percent ad valorem. Any change in this duty after the war would probably be of little importance; even if synthetic rubber were free of duty imports would probably continue to consist almost entirely of natural rubber. The statistics of imports for 1939 in the above table include the very small quantity of synthetic rubber which was imported in that year.

Before the war the world supply of natural rubber came almost entirely from British Malaya and the Netherlands Indies, controlled respectively by the British and the Dutch. These areas were lost to the Japanese in the early part of 1942. The United States, within 2 years thereafter, had erected a synthetic-rubber industry with a rated annual capacity of 850,000 tons, which has proved to be less than the actual capacity. In the latter part of 1944, the domestic industry was producing at the rate of more than 1 million tons annually.

The consumption of rubber in the United States has continued to grow over a long period of time. This upward trend was accentuated beginning late in 1939 because of increased exports of manufactured rubber goods used as war materials. Consumption (actual, not "apparent") averaged 538,000 tons in 1936-39.

POST-WAR SHORT TERM

The natural-rubber industry of the Far East will require time for revival. During this period, moreover, the backlog of demand for tires and other rubber goods in the United States and abroad is likely to be so large that our synthetic industry will be required to produce at the rate of over 1 million tons annually, some of which undoubtedly will be exported. Domestic consumption of rubber (natural and synthetic) may well be 60-75 percent higher than the average for 1936-39 (then mostly natural rubber).

It is probable that 300,000-400,000 tons of natural rubber will be available to the world from the rubber plantations of the Far East the first year after they are recaptured from the Japanese. This will be in addition to whatever may be available from Ceylon, India, South America, and Liberia (now about 200,000 tons annually). Full-scale capacity for production of rubber in the Far East perhaps could not be reached until two or three years after liberation; it might then be possible to reach an annual capacity of about 1½ million tons. Before the anticipated keen competition between natural and synthetic

¹ Consumption of reclaimed rubber in the United States averaged about 150,000 tons annually (actual rubber content about 80,000 tons) during the years just before the war. Reclaimed rubber is not included in the following report, however, because of its subordinate use and the minor effect it will have on the future use of new rubber.

rubber will have developed, however, the United States Government will probably have determined its rubber policy.

During the few years immediately following the war, even though the domestic synthetic rubber industry may be operating at approximately full capacity, imports of natural rubber are likely to increase gradually, as supplies available in the Far East increase. Whatever developments may occur in the longer post-war period as to the quality of synthetic rubber, it seems doubtful whether during the short-term post-war period synthetic rubber will be produced (at a competitive cost level), which will be considered equal to natural rubber for certain major uses (especially in heavy-duty tires). Imports of natural rubber during the first year after the close of the war with Japan might then amount to as much as 250,000 tons (about half of the world supply, above estimated as available) and they might increase within the next 2 years or so to as much as 500,000 tons annually. It is impossible to forecast with any accuracy what will be the unit prices of these imports. The price of natural rubber in the Far East might be approximately the same as in 1939 or might be appreciably higher. Presumably the price will be higher in the first year after the war than a little later.

POST-WAR LONG TERM

Consumption, Production, and Imports

Crude natural rubber is duty-free at present. It is impossible to make forecasts regarding imports without taking into account the possibility that the United States Government may determine to take some measures which will in effect restrict imports, if deemed necessary in order to assure the maintenance of a domestic synthetic-rubber industry of the desired magnitude. Restrictive measures might take the form of imposition of a duty, quantitative limitation of imports, or subsidization of domestic production within specified limits.

It is impossible (and in any event unnecessary for the purposes of the present report) to forecast how much, if any, governmental aid would be necessary to assure a given domestic production of synthetic rubber. The answer would depend on unforeseeable changes in the costs of production of both synthetic and natural rubber, and on unforeseeable changes in the quality of synthetic rubber produced in this country. It is reasonably certain that in the long-term post-war period costs of production of synthetic rubber in the United States will be materially lower than under the present abnormal war conditions, but how much lower cannot be predicted. It is also reasonably certain that the quality of synthetic rubbers will be improved, but it is impossible to predict whether types will be developed which (within competitive cost levels) are equal to natural rubber in all major uses. Developments as to both costs and quality might be such that, by, say, the first half of the 1950 decade, the domestic synthetic-rubber industry would be able to supply virtually the entire domestic market for rubber without any Government assistance.

The presentation of the tabulation below regarding the possible post-war relation between domestic production and imports should not be understood as implying any expression of opinion as to whether the specified quantity of domestic production will be achieved through

normal competition with imported rubber or through artificial measures; nor any opinion as to how much domestic production it would be desirable to maintain if that level could be maintained only by government aid.

The tabulation is calculated on the following ratios of the use of synthetic rubber to total requirements: (a) One-fifth, (b) one-third, (c) one-half, and (d) three-fourths. These are apart from a fifth possibility that the synthetic-rubber industry might be able to supply virtually the whole demand in unaided competition with the natural product.

These ratios are applied to the two estimates of post-war domestic consumption, based on a per capita income as in 1939, and on an income 75 percent higher. The tabulation comparing the quantity and value of production and of imports under each assumption as to the percentage share of consumption supplied by the domestic product is given below:

Synthetic rubber	Per capita income as in 1939		Income 75 percent higher than in 1939	
	Quantity	Value	Quantity	Value
	1,000 tons	Millions of dollars	1,000 tons	Millions of dollars
Estimated domestic consumption ¹ :	700		950	
Share supplied by domestic production, about 25 percent:				
Production.....	175	52	238	71
Imports.....	525	147	712	199
Share supplied by domestic production, about 33¼ percent:				
Production.....	233	70	317	95
Imports.....	467	131	633	177
Share supplied by domestic production, about 50 percent:				
Production.....	350	105	475	142
Imports.....	350	98	475	133
Share supplied by domestic production, about 75 percent:				
Production.....	525	158	712	214
Imports.....	175	49	238	67

¹ It is believed that the minimum figure in each case would be 50,000 tons below the estimate given and the maximum figure 50,000 tons above it.

² Assumed unit value per pound of production, 15 cents, of imports (foreign value), 14 cents.

Synthetic rubbers include numerous varieties. Apart from certain basic differences in methods of production, it is possible to modify the characteristics of most types of rubber by special methods of treatment. Furthermore, the uses of rubber are numerous. For some uses certain qualities are desirable and for other uses quite different qualities. Some types of synthetic rubber are better than natural rubber for a number of special purposes. No synthetic rubber now being produced (at a competitive cost) is considered equal to natural rubber for some major uses, but this situation may change with further development of technique.

It is generally recognized that, with no government aid whatever, the domestic industry would supply in the post-war period a considerable fraction of the total consumption of rubber. This output would include those types which are superior to natural rubber for special uses, together with certain quantities of general-purpose synthetic rubbers, which when mixed with natural rubber give a

product substantially, if not entirely, equal to natural rubber for other important uses. In any case at least 25 percent of the consumption requirements in the post-war period will probably be supplied by the domestic synthetic industry.

Per capita income at 1939 level.

For a long time before the war there was a general upward trend in the consumption of rubber in the United States. Even with a per capita income in the long-term post-war period no higher than in 1939, the per capita consumption of rubber would probably be from 15 to 25 percent greater than the pre-war average, and, taking into account the increase in population, the total consumption would probably be from 25 to 40 percent greater. In that event consumption would be between 650,000 and 750,000 tons; the mean of these figures, 700,000 tons, is used as the basis in the table above.

This estimate of post-war consumption is based on the assumption that prices of rubber will be about the same as they were in 1939, when the average foreign unit value of imports (which then supplied nearly all the consumption) was about 15 cents per pound. If, whether by reason of reduction of costs of both synthetic and natural rubber, or by reason of severe competition between them, the price of rubber should be materially lower than in 1939, say from 9 to 12 cents, the consumption might be appreciably greater than that estimated. Although price reduction would have little effect on the consumption in tires, by far the most important present use, it would probably cause marked expansion in the consumption of rubber for various other uses, including some to which it has not hitherto been applied. If by chance the price of rubber should be much lower still, say, from 7 to 8 cents per pound, still further expansion in consumption would presumably take place.

Per capita income 75 percent higher than in 1939.

Such a marked increase in per capita income would tend to expand considerably the number of automobiles in use, and the amount of travel per automobile. Moreover, car owners would be disposed to renew worn tires more promptly than otherwise. Aviation would likewise be expanded, calling for more airplane tires. Rubber consumption in various other uses would also increase; in particular, consumers would presumably be able to afford the use of rubber for various purposes for which it would not otherwise be employed.

Under these conditions it seems probable that the per capita consumption of rubber would be about one-third greater than if national income should remain as in 1939. If so, it would be somewhere between 900,000 and 1,000,000 tons annually (taken as 950,000 tons in the tabulation, which is about 60 percent greater than the consumption in 1939). This seems to be a conservative estimate.

This estimate regarding consumption is based on the assumption that the prices of rubber would be about the same as in 1939. Even if commodities in general should show an upward price trend because of higher income, the greater volume of output of synthetic rubber would tend to prevent an increase in the cost of production. If rubber prices should be materially lower than in the pre-war period, the consumption of rubber might be materially greater than estimated.

Exports

Although exports of synthetic rubber from the United States may be in great demand during the immediate post-war period, rapidly expanding synthetic rubber industries in Europe, together with the recovering natural rubber industry, may eventually capture a considerable part of the export trade this country has acquired during the war. There seems to be a fair possibility, however, that even during the long term there will be some exports of synthetic rubber, especially of special-purpose types, which may be superior to natural rubber for various uses. Much will depend on how much synthetic rubber Germany will be allowed to manufacture, on the post-war progress of the Soviet synthetic-rubber industry, and on synthetic-rubber production in other industrial countries.

Employment

The present wartime production in the United States of approximately one million tons of synthetic rubber requires about 25,000 employees, including those engaged in the production of the principal ingredients butadiene and styrene. The huge synthetic plants are largely operated from control rooms and a plant running at half capacity would require virtually the same number of workmen. Furthermore, it requires about the same number of men to operate a small plant as a large one. An idle plant kept in stand-by condition would require about one-fourth as many employees as when operating at capacity. Employees are classified in a general way as follows: Operators, about 35 percent; maintenance men, about 27 percent; supervisors and administrators, about 13 percent; special technicians, about 10 percent; and miscellaneous employees, about 15 percent.

GUTTAS

Tariff paragraph: 1697.

Commodity: Gutta balata, and gutta percha and other guttas, n. e. s.

Rate of duty: Free.

GENERAL

Data on United States imports for 1939 are given below:

Quantity (1,000 pounds).....	5,464
Value (\$ 1,000).....	1,805
Unit value (cents per pound).....	14.6

† Foreign value.

Gutta, which is not produced in the United States, is the coagulated latex of certain types of trees. It is somewhat similar to rubber but has a much higher resin content. Gutta percha and balata are the two most important types, although about 25 other types known as inferior guttas are used commercially. They are used in making covers for golf balls and submarine cables, adhesive tape, transmission belting, dental fillings, chewing gum, and many other widely varied items. Balata comes almost entirely from Latin America, whereas gutta percha and most of the other guttas originate largely in the Far

East. World production of most guttas has declined in recent years because of a decline in demand and because easily available supplies have been reduced by depleting the trees. The decline in demand has been the result of the discovery of better materials for certain uses and of a decrease in the production of some articles in which guttas were used. For example, changes in methods of communication (wireless) have substantially reduced the need for submarine cables, which formerly required huge amounts of guttas. New developments in plastics and synthetic rubbers may further reduce the need for guttas.

POST-WAR SHORT TERM

There will be some backlog of demand for guttas immediately after the war, especially for balata for covering golf balls for which as much as a million pounds might be needed. A smaller postponed demand for guttas to be used in the manufacture of belting and other equipment will also exist. It is quite possible that the demand for guttas will be larger than the supply for some time after the war. A resumption of full-scale production in the Far East may be delayed for a period; supplies from Latin America, even though they may be larger than during the war, will not be adequate. United States imports and consumption immediately after the war may range from a minimum of about 3 million pounds, valued at about \$450,000, the first year to as much as 6 million pounds, valued at nearly 1 million dollars, the third or fourth year.

POST-WAR LONG TERM

Per capita income at 1939 level.

There is little likelihood that United States consumption of guttas will be much larger during the 1950 decade than in 1939 if per capita income remains the same as 1939. The consumption of some articles, such as golf balls, may expand, but the extra amount of guttas needed for them might be more than offset by declines in other uses. Even taking into consideration the increase in population, it does not seem probable that imports of guttas will increase over the 1939 level of 5½ million pounds or be valued at more than a million dollars. At the 1939 income level, prices are not likely to increase.

Per capita income 75 percent higher than in 1939.

A high national income would tend to increase the production and consumption of some articles in which guttas are used, such as golf balls and belting, but with others the effect would probably be negligible. On the other hand, the use of guttas for some articles, such as submarine cables, will decline regardless of income level. An enormous increase in golf playing would be required to increase substantially the amount of gutta that would be consumed. The net effect of the probable increases and decreases in the use of guttas in the future would perhaps be an added consumption of some 5 to 10 percent over 1939, which would mean imports of between 5.7 million and 6 million pounds valued at about 1 million dollars.

JELUTONG OR PONTIANAK

Tarif paragraph: 1697.

Commodity: —Jelutong or pontianak.

Rate of duty: Free.

GENERAL

Data on United States imports for 1939 are given below: ¹

Quantity (1,000 pounds).....	14, 873
Value (\$1,000).....	² 1, 603
Unit value (cents per pound).....	10. 8

¹ Reexports are negligible.

² Foreign value.

Jelutong (pontianak) is the coagulated latex of the *Dyera* tree. Although it is botanically classified as a rubber, it has a resin content of about 75 percent, which is much higher than that in the more common forms of rubber. It deteriorates rapidly when exposed to air, but it can be kept for substantial periods under water or in hermetically sealed containers. Its principal use is in the manufacture of chewing gum.

About four-fifths of the entire world supply originates in British Malaya and the other one-fifth in the Netherlands Indies, where it is obtained almost entirely from wild trees. The United States consumes more than 90 percent of the world supply. Since there is no domestic production and reexports are negligible, imports represent domestic consumption.

POST-WAR SHORT TERM

The immediate post-war demand in the United States will probably be 15-16 million pounds of jelutong annually, which is slightly in excess of pre-war consumption. However, since rubber is the principal commodity produced in the areas supplying jelutong, labor will be engaged primarily in rehabilitating that industry. It may take, therefore, as much as 3 years before United States requirements can be met, unless prices rise sufficiently to induce natives to collect jelutong rather than rubber. During the immediate post-war period, imports should reach about 15 million pounds, valued at roughly 2 million dollars.

POST-WAR LONG TERM

Consumption, Production, and Imports

If the chewing-gum habit maintains or increases its popularity in the United States and continues to spread abroad, as is anticipated by the domestic industry, the imports of jelutong may be larger in the 1950's than in 1939. Consumption may be retarded, however, by limited supplies. Since a large number of the most readily accessible trees have been destroyed or depleted, rigid laws governing tapping have been imposed in the areas of largest production. Even if plantations were eventually established, they probably would not be producing large quantities during the 1950's, since it would take 8 or more years to bring the trees to a producing stage. High prices, however, might encourage gatherers to go farther into the jungle to seek out untapped trees.

Per capita income at 1939 level.

Domestic brands of chewing gum have found favor in many parts of the world during the war. If exports of chewing gum are larger in the 1950's and domestic consumption increases with the population, imports of jelutong may be as much as 15 percent higher than in 1939, amounting to as much as 17 million pounds valued, at 1939 prices, at about 2 million dollars.

Per capita income 75 percent higher than in 1939.

Sales of chewing gum have tended to increase with national income. A larger per capita income, with an increase in population and larger exports, might increase imports of jelutong as much as 30 percent. Imports would then amount to about 19 million pounds valued, at increased prices, at about 2.3 million dollars. In the final analysis, however, inelasticity of supply may constitute the most important limitation on imports.

Exports

There will probably be no exports or reexports of jelutong as such, but shipments of chewing gum abroad may eventually reach fairly substantial quantities during the 1950's.

IVORY TUSKS

Tariff paragraph: 1701.

Commodity: Ivory tusks, natural, or cut vertically across the grain, bark intact.

Rate of duty: Free.

GENERAL

Data on United States imports for 1939 are given below:¹

Quantity (1,000 pounds)-----	59
Value (\$1,000)-----	\$ 132
Unit value (per pound)-----	\$2.24

¹ Reexports have been negligible.

² Foreign value.

The principal use of ivory tusks (about 85 percent of the consumption) has been in making piano keys, and minor uses have been in making billiard and pool balls, cutlery handles, novelties, and objects of art. Inasmuch as ivory is a relatively scarce material, its use is quite limited. Most of the crude ivory entering world markets originates in Africa.

United States consumption has been affected chiefly by changes in the demand for pianos and by competition from plastics. In recent years plastics have been successfully used as a substitute for ivory, and the trend in per capita consumption of ivory has been downward.

In the 5 years, 1935-39, consumption (i. e., imports) averaged about 54,000 pounds annually valued at about \$128,000. Imports were larger in 1940 and 1941, but by 1943 imports were only 6,457 pounds, piano production in the United States having been discontinued by Government action in 1941 to conserve materials and labor.

POST-WAR SHORT TERM

It is probable that production of pianos will be substantially larger than in 1939 because of the sizable backlog of demand. Consumption of ivory (from imports and from such stocks as may exist in this country) in that period, therefore, is likely to be substantially above the 1939 level.

POST-WAR LONG TERM

Per capita income at 1939 level.

The increase in population might be sufficient to offset the trend toward decline in the per capita consumption of ivory. Imports might thus about equal the pre-war average of 54,000 pounds, with a foreign value of about \$130,000.

Per capita income 75 percent higher than in 1939.

A higher per capita income would tend to increase the demand for higher-priced pianos, for which ivory keys will probably continue to be used despite increased use of other materials for keys in lower-priced pianos. Allowing, however, for a continuing decline in the use of ivory for medium- and low-priced pianos, there might be a net increase of only about 25 percent in the demand for ivory tuaks, so that imports might amount to about 70,000 pounds, with a foreign value, allowing for a moderate increase in prices, of about \$170,000.

MOTHER-OF-PEARL SHELLS

Tariff paragraph: 1738.

Commodity: Pearl, mother of, and shells * * * not sawed, cut, etc.

Rate of duty: Free.

GENERAL

Data for United States imports for 1939 are given below:

Quantity (1,000 pounds)-----	10, 525
Value (\$1,000)-----	1, 465
Unit value (cents per pound)-----	14

¹ Foreign value.

Mother-of-pearl shells are one of a large variety of ocean shells and the most important kind imported into the United States. Mother-of-pearl is used in the United States almost entirely for making pearl buttons. Since there is no domestic production of these shells, United States requirements are met entirely by imports. In the years 1937-41, imports averaged 9 million pounds annually valued at more than 1½ million dollars. Australia, the Netherlands Indies, and Japan were the most important sources of mother-of-pearl shells before the war. Since 1941, French Oceania, the Arabian Peninsula States, and the Anglo-Egyptian Sudan have supplied the bulk of imports.

POST-WAR SHORT TERM

It may require several years to reestablish the shell-fishing fleets in the Far East after the war. It seems probable, therefore, that imports will remain below the 1939 level during the short-term period.

POST-WAR LONG TERM

Consumption of pearl buttons will probably gradually decline from the 1939 level, owing to an increasing use of buttons made from other materials, principally plastics. This would, of course, be accompanied by a corresponding decline in imports of mother-of-pearl shells. In view of the competitive position of mother-of-pearl buttons and plastic buttons, prices probably would not increase materially over 1939 levels.

Per capita income at 1939 level.

Owing to competition of plastic buttons, per capita consumption of pearl buttons may decline somewhat from the 1939 level. Imports would probably be about 10 percent less than in 1939 or about 9½ million pounds with a foreign value of about 1¼ million dollars.

Per capita income 75 percent higher than in 1939.

A higher national income would tend to increase the consumption of pearl buttons and hence to increase the importation of mother-of-pearl shells. On the basis of estimates of total consumption of pearl buttons,¹ imports would be about 20 percent higher than under the 1939 income, amounting to about 12 million pounds, valued (assuming slightly higher foreign prices) at about 1.8 million dollars.

VEGETABLE IVORY

Tariff paragraph: 1778.

Commodity: Vegetable ivory, or tagua nuts.

Rate of duty: Free.

GENERAL

Data on United States imports less reexports for 1939 are given below:

Quantity (1,000 pounds)-----	11, 583
Value (\$1,000)-----	121
Unit value (cents per pound)-----	1. 0

¹ Foreign value.

Vegetable ivory (tagua nuts) is not produced in the United States; it is used in this country principally for making buttons. Vegetable ivory buttons are relatively high-priced. Ecuador has been the source of more than 90 percent of all imports of ivory nuts in recent years. Reexports have been comparatively large, generally amounting to about two-fifths of the quantity of pre-war imports.

Imports of vegetable ivory and, consequently, the production of ivory buttons, declined almost steadily from about 1925 until 1941 and 1942 when there was a temporary interruption in this trend; since 1942 imports have continued to decline. Vegetable-ivory buttons compete with buttons made of other materials, such as synthetic resins and other plastics, which have proved satisfactory and in some instances are lower in price.

POST-WAR SHORT TERM

In the immediate post-war period imports of tagua nuts may be about the 1939 level.

POST-WAR LONG TERM

Greater utilization of plastic materials for buttons would probably mean a continuation of the pre-war downward trend in the use of vegetable ivory for this purpose. Although the duty on vegetable-

¹ See section in this series on pearl or shell buttons.

ivory buttons is relatively high, a 50-percent reduction of it would probably not result in a sufficient increase in the relatively small imports of such buttons to cause a material reduction in the imports of vegetable ivory.

Per capita income at 1939 level.

It is doubtful that imports of tagua nuts would reach the 1939 level even allowing for an increase in population; and it is possible that they might be considerably smaller. Thus imports (less reexports) might not amount to more than 11 million pounds, with a foreign value, at prices somewhat above the 1939 level, of about \$130,000.

Per capita income 75 percent higher than in 1939.

Consumption of vegetable-ivory buttons would probably be somewhat greater, say, about 20 percent, under a higher national income; the larger demand for higher-priced clothing containing such buttons would be responsible for this increase. Notwithstanding the long-term trend toward greater use of substitutes, imports might, under these conditions, amount to about 13 million pounds. Because of competition with plastic materials, the price of vegetable ivory might increase less than the general price level, perhaps by about 5 percent. The imports might thus have a foreign value of about \$170,000.

WORKS OF ART AND ANTIQUES

Tariff paragraphs: 1807 and 1811.

Commodity: Original etchings, paintings, and sculptures. Works of art (except rugs and carpets made after the year 1700) *▲* * artistic antiquities and objects of art of ornamental character, made before 1830; and violins, violas, violincellos, and double basses, made before the year 1801.

Rate of duty: Free.

GENERAL

Data on United States production and imports for 1939 are given below:

Item	Production		Imports less reexports
	Total	For export	
Value (\$1,000).....	(?)	1,287	\$ 13,000

¹ United States production statistics are not available but production of original etchings, paintings, and sculptures is known to be large.

² Foreign value.

The works of art and antiques under consideration include a wide variety of articles. Some of the more important are artistic proof etchings, engravings, wood cuts, original paintings, pastels, drawings and sketches, original sculptures or statuary, furniture, silverware, violins, violas, violincellos, and double basses.

Works of art and antiques are very largely luxury items, imported to be sold to persons in the high-income group or to museums and art galleries. Imports have varied with the level of national income. In 1926-30 the annual average was more than 65 million dollars.

Because the works of art produced domestically and those imported are for the most part quite different in character, and because no data are available as to domestic production, estimates for the post-war period are confined to imports.

POST-WAR SHORT TERM

The large accumulated demand resulting from the decline in imports during the war and greater purchasing power might cause imports to be much larger than in 1939.

POST-WAR LONG TERM

Consumption, Production, and Imports

Per capita income at 1939 level.

The demand for works of art would probably reflect the increase of population and therefore be about 10 percent higher than in 1939. The foreign value of imports might thus be about 14 million dollars.

Per capita income 75 percent higher than in 1939.

Imports would probably increase at least in proportion to the rise of national income. They may then have a foreign value of at least 25 million dollars. They might be far larger, as indicated by the figures for 1926-30, possibly as much as 65 million dollars. Imports of antiques might, however, be more subject to restrictions by foreign governments on their exportation than they were during that 5-year period.

Exports

With higher world income exports might increase somewhat over the level of 1939.

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