# NORTH AMERICAN ECONOMIC INTERDEPENDENCE II

## HEARING

BEFORE THE

## SUBCOMMITTEE ON INTERNATIONAL TRADE

OF THE

## COMMITTEE ON FINANCE

## UNITED STATES SENATE

NINETY-SIXTH CONGRESS

FIRST SESSION

OCTOBER 1, 1979

Printed for the use of the Committee on Finance

U.S. GOVERNMENT PRINTING OFFICE

53-231 O WASHINGTON : 1979 HG 96-42

## COMMITTEE ON FINANCE

RUSSELL B. LONG, Louisiana, *Chairman*

HERMAN E. TALMADGE, Georgia
ABRAHAM RIBICOFF, Connecticut
HARRY F. BYRD, JR., Virginia
GAYLORD NELSON, Wisconsin
MIKE GRAVEL, Alaska
LLOYD BENTSEN, Texas
SPARK M. MATSUNAGA, Hawaii
DANIEL PATRICK MOYNIHAN, New York
MAX BAUCUS, Montana
DAVID L. BOREN, Oklahoma
BILL BRADLEY, New Jersey

ROBERT DOLE, Kansas
BOB PACKWOOD, Oregon
WILLIAM V. ROTH, JR., Delaware
JOHN C. DANFORTH, Missouri
JOHN H. CHAFEE, Rhode Island
JOHN HEINZ, Pennsylvania
MALCOLM WALLOP, Wyoming
DAVID DURENBERGER, Minnesota

MICHAEL STERN, *Staff Director*
ROBERT E. LIGHTHIZER, *Chief Minority Counsel*

---

### SUBCOMMITTEE ON INTERNATIONAL TRADE

ABRAHAM RIBICOFF, Connecticut, *Chairman*

HERMAN E. TALMADGE, Georgia
HARRY F. BYRD, JR., Virginia
MIKE GRAVEL, Alaska
DANIEL PATRICK MOYNIHAN, New York
MAX BAUCUS, Montana
BILL BRADLEY, New Jersey

WILLIAM V. ROTH, JR., Delaware
JOHN C. DANFORTH, Missouri
JOHN HEINZ, Pennsylvania
ROBERT DOLE, Kansas
JOHN H. CHAFEE, Rhode Island

# CONTENTS

## ADMINISTRATION WITNESSES



## PUBLIC WITNESSES



## ADDITIONAL INFORMATION

# NORTH AMERICAN ECONOMIC INTERDEPENDENCE II

MONDAY, OCTOBER 1, 1979

U.S. SENATE,
COMMITTEE ON FINANCE,
SUBCOMMITTEE ON INTERNATIONAL TRADE,
*Washington, D.C.*

The committee met, pursuant to notice, at 9:35 a.m., in room 2221, Dirksen Senate Office Building, Hon. Max Baucus (chairman of the subcommittee) presiding.

[The press release announcing this hearing follows:]

[Press Release No. H-159]

For immediate release: September 17, 1979.
From: U.S. Senate, Committee on Finance, Subcommittee on International Trade, 2227 Dirksen Senate Office Building.
Re Finance Subcommittee on International Trade Announces Hearing on North American Economic Interdependence.

The Honorable Abraham Ribicoff (D., Ct.), Chairman of the Subcommittee on International Trade of the Committee on Finance, today announced that the Subcommittee will hold the second of its hearings on issues relating to North American economic interdependence. Senator Max Baucus (D., Mt.), who will chair the hearing, stated that he intends to further examine the U.S. Government and private sector relationship with Canada and Mexico. "North America needs to better pursue its mutual self-interests," Senator Baucus explained, "and at the present time it is clear that individually, and as a whole, we are not working to our potential. Increased interdependence may or may not be a good idea," he stressed, "but the future will require us to understand more clearly what we should, and should not, encourage." He added, "I am only interested in our common and mutual interests. Improving specific sector cooperation may be in all of our interests, and if so we should better understand how we could accomplish this goal."

The hearing will begin at 9:30 A.M., Monday, October 1, 1979, in Room 2221 Dirksen Senate Office Building.

Witnesses scheduled to appear are as follows:

(1) The Honorable Pete V. Domenici, United States Senator from New Mexico.

(2) The Honorable George Clifford Van Roggen, Canadian Senator from British Columbia.

(3) Panel I: Scientific and Technological Cooperation: Mr. Thomas R. Pickering, Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs; Mr. Harvey Averch, Assistant Director, Directorate for Scientific, Technological, and International Affairs, National Science Foundation; and Mr. Princeton Lyman, Acting Director, Institute for Scientific and Technological Cooperation.

(4) Panel II: Agricultural and Technical Exchange: Dr. John Pino, Director of Agricultural Sciences, The Rockefeller Foundation and Dr. Norman Borlaug, Director, Wheat Program, Centro Internacional de Mejoramiento de Maiz Y Trigo (CIMMYT).

(5) Panel III: Petrochemicals: Mr. Robert E. Naegele, President and Chief Executive Officer, Dow Chemical of Canada, Ltd. and Mr. C. L. Mort, Vice President, New Business Ventures, Services and Government Affairs, Dow Chemical of Canada, Ltd.

Written statements.—Persons who desire to present their views to the Subcommittee should prepare a written statement for submission and inclusion in the printed record of the hearings. These written statements should be submitted to Michael Stern, Staff Director, Senate Committee on Finance, Room 2227 Dirksen

Senate Office Building, Washington, D.C. 20510, not later than Friday, October 19, 1979.

Senator BAUCUS. The Subcommittee on International Trade will come to order.

This is the second of a series of hearings I am chairing on North American interdependence. My first hearing was June 6, and at that time we probed the general overall implications of increased North American interdependence. Today, I hope to take this further and to examine some specific areas where it is in our mutual and individual interests to accelerate exchange. It is by no means a comprehensive overview, but rather an attempt to delineate more clearly the areas where there are opportunities for more mutual benefit. In addition, I believe that by probing certain specific areas, such as science and technology, we can obtain a better overall understanding of the effectivness of our respective governments in administering to our own interests.

I wish to make myself very clear when I emphasize my concern for developing only that which is in North America's mutual interest. I do not believe that North America is ready for a common market of energy or trade. Our neighbors are not interested in this, and it is doubtful that American industry itself would benefit from free and unrestricted access to its market.

In my view, it is a mistake to attempt to capsulize our relationship with Mexico and Canada in the phrase "energy common market." That is a simple, easy, and catchy sentence, but I do not believe it will work.

However, I am very much in favor of searching for areas of mutual interest, and improving specific sector cooperation may be one of these. It is clear to me that North American relations are not at their potential. We can do much more to improve our cooperation, and with important results for all of us.

One of my concerns is the lack of coordination and oversight within the U.S. Government of its many programs with Canada and Mexico. The General Accounting Office has just concluded a study of these programs for me, and it confirms my suspicions that the U.S. Government must better understand its own shortcomings. "None of the respondents," and I quote the GAO study, "including the Department of State, advocated structural changes in any U.S. agencies that deal with either Canada or Mexico."

The President, on the other hand, in a memorandum dated April 26, 1979, underscored the importance "to improve our ability to address effectively all issues which affect U.S. relations with Mexico." To this end, and at the Department of State's insistence, the Senate Foreign Relations Committee last week approved Robert Krueger as Ambassador-at-Large and Coordinator for Mexican Affairs.

In this unprecedented step, for this first Ambassador-at-Large to be appointed to a particular country, the President himself is acknowledging the need for a more coherent and flexible administration of overall U.S. policy objectives toward Mexico.

Seventy-one U.S. governmental agencies have hundreds of programs in both Canada and Mexico. I agree with the President that there is a need for more effective coordination and oversight.

I would like the GAO study, which includes the President's memorandum, to be made a part of the hearing record.

[The material referred to follows:]



UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

INTERNATIONAL DIVISION

September 27, 1979

B-196090

The Honorable Max S. Baucus
United States Senate

Dear Senator Baucus:

Subject: United States Government Agencies' Relations With Canada and Mexico. (ID-79-57)

Your letter of June 18, 1979, requested that we report on how U.S. Government agencies are organized to deal with Canada and Mexico.

We developed a questionnaire in consultation with your staff to solicit information from Federal agencies on the nature and extent of their interests in and cooperation with Canada and Mexico, and the way these interests are coordinated. In early August we sent questionnaires to 71 Federal agencies and offices (see enc. I) that have some contact with either Canada or Mexico. Although we received 68 responses from agencies and offices who deal with either Canada or Mexico, we found that 31 have frequent contact with the Federal Governments of both countries. Therefore, our analyses were based on information furnished by those 31 respondents. In addition to the questionnaire, we made contact with some respondents for clarification or elaboration of information provided.

The nature of the respondents' primary interests in either Canada or Mexico is briefly described in enclosure II. Also, the respondents' research programs are described in enclosure III.

QUESTIONNAIRE RESULTS

Responses to our questionnaire showed that:

--The majority of the respondents that reported frequent staff involvement on matters relating to both Canada and Mexico stated that the staff members involved are located in several organizational units.

--In most program areas of interests, respondents have similar interests in both countries.

--Almost all respondents feel that cooperation received from the Canadian and Mexican Governments is adequate.

--Approximately three-fourths of the respondents coordinate their activities with the Department of State while others coordinate their activities primarily with the Departments of Agriculture and Commerce which also maintain staffs in both countries. A few respondents, however, make direct contacts with their foreign counterparts.

--Most respondents believe that if an organizational structure change were made in the Department of State to place the management of U.S. relations with Canada and Mexico in a single unit, there would be little, if any, change in their relationships with the two countries.

--None of the respondents including the Department of State, advocated structural changes in any U.S. agencies that deal with either Canada or Mexico.

The Office of the Assistant Secretary of Defense, International Security Affairs, Inter-American Region, and Agriculture's Office of International Cooperation and Development felt that closer cooperation could be achieved among the three countries of North America if they established a trilateral mechanism to review and discuss programmatic issues of mutual interest.

State's Bureau of European Affairs includes management of Canadian affairs because Canada, unlike Mexico, is an Atlantic power and shares the same issues which confront other Organization for Economic Cooperation and Development and North Atlantic Treaty Organization members. According to the Bureau, to remove responsibility for administration of Canadian affairs from their office and place management of U.S. relations with Canada and Mexico in a single organizational unit would have a moderately negative effect on management of U.S./Canadian relations.

BILATERAL ORGANIZATIONS

In addition to the relations between U.S. agencies and Canadian and Mexican counterparts in areas falling within their purview, several bilateral organizations have been

created to promote closer cooperation between the United States, Canada, and Mexico to prevent disputes regarding international boundaries, to settle questions involving rights, to consider broad plans for defense of the northern half of the Western Hemisphere, to protect common interests of either country, and to make provisions for the adjustment and settlement of any question which may arise. These organizations are listed below.

--International Boundary Commission, United States and Canada

--International Joint Commission, United States and Canada

--Permanent Joint Board on Defense, United States and Canada

--International Boundary and Water Commission, United States and Mexico

--Joint Mexican-United States Defense Commission

SPECIAL BILATERAL MECHANISMS

The United States has occasionally established special bilateral mechanisms with Canada and Mexico to examine problems and propose solutions regarding common policy interests. These mechanisms are basically bureaucratic forums which, in theory, provide a basis for governmental organizational interface on issues and help overcome any bureaucratic and political barriers to cooperation.

Canada and Mexico

The United States has entered into two bilateral arrangements with Canada and two bilateral arrangements with Mexico to deal with overall relations between the countries. In each case they are called the Quadripartite Commission and the Interparlimentary Group. The Quadripartite Commissions are composed of U.S. legislators and U.S. businessmen to meet periodically to discuss bilateral relations with the other country. The Interparliamentary Groups are composed of U.S. legislators who meet yearly to exchange opinions and discuss political, social and economic issues with their counterparts in the other country.

Mexico

To focus more attention on Mexico's development problems and the need to establish a solid productive relationship, the U.S. Government and the Mexican Government formed the United States-Mexican Consultative Mechanism. This Mechanism consists of nine joint commissions (see encs. IV and V) through which high-level representatives could maintain close, regular contact. These commissions are to address problems in the following areas: border cooperation, trade, finance, tourism, industry and development, migration, energy, law enforcement, and multilateral consultations. In addition, other bilateral commissions and consultative groups exist in the fields of science and technology, cultural cooperation, water and boundaries, agricultural cooperation, and parks and wildlife under the umbrella of the Consultative Mechanism.

SAINT LAWRENCE SEAWAY DEVELOPMENT CORPORATION

The Saint Lawrence Seaway Development Corporation was established specifically to cooperate with Canada. The Corporation is directed by the Department of Transportation. It coordinates its activities with its Canadian counterpart with respect to overall operations, traffic control, safety, season extension, and related programs designed to fully develop the seaway between Montreal and Lake Erie.

- - - -

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 5 days from the date of issue. At that time, we will send copies to the Secretaries of the executive departments, selected independent agencies and bilateral organizations, and interested Members of Congress.

Sincerely yours,

J. K. Fasick

J. K. Fasick
Director

Enclosures - 5

ENCLOSURE I

## AGENCIES WITH PROGRAMS OR INTERESTS RELATED TO CANADA AND/OR MEXICO

### Independent Agencies

American Battle Monuments Commission
Civil Aeronautics Board
Environmental Protection Agency
Export-Import Bank of the U.S.
Federal Communications Commission
Federal Maritime Commission
International Communication Agency
Inter-American Foundation
Interstate Commerce Commission
Overseas Private Investment Corporation
U.S. Arms Control and Disarmament Agency
U.S. International Trade Commission
Office of the Special Representative for Trade Negotiations

### Department of Health, Education, and Welfare

National Institute on Alcohol Abuse and Alcoholism
National Institute on Drug Abuse
National Institute of Mental Health

### Department of the Interior

U.S. Fish and Wildlife Service
Bureau of Mines
Geological Survey

### Department of Justice

Federal Bureau of Investigation
Immigration and Naturalization Service
Drug Enforcement Administration

### Department of Agriculture

Foreign Agriculture Service
Economics, Statistics, and Cooperatives Service
Federal Grain Inspection Service
Office of the General Sales Manager
Soil Conservation Service
Food Safety and Quality Service
Forest Service
Science and Education Administration
Plant Protection and Quarantine Program
Veterinary Services

Federal Corp Inspection Corporation, Office of the Manager
Office of Governmental and Public Affairs
Attorney General-Secretariat for Agriculture, Commission of Customs
Office of International Cooperation and Development

Department of Energy

Energy Information Administration
Assistant Secretary for International Affairs

Department of Labor

Bureau of Labor Statistics
Deputy Under Secretary for International Affairs

Department of Transportation

U.S. Coast Guard
Federal Aviation Administration
Federal Highway Administration
Research and Special Programs Administration
St. Lawrence Seaway Development Corporation

Department of the Treasury

Bureau of Alcohol, Tobacco and Firearms
U.S. Customs Service
Bureau of the Mint
U.S. Secret Service
Office of Developing Nations Finance
Internal Revenue Service

Department of Commerce

Maritime Administration
National Oceanic and Atmospheric Administration
U.S. Travel Service
Economic Development Administration
Bureau of Export Development
Bureau of International Economic Policy and Research

Department of Defense

Secretary of the Air Force
Secretary of the Army
Secretary of the Navy

Operations Directorate, Defense Security Assistance Agency
Office of the Assistant Secretary of Defense, International Security Affairs, Inter-American Region
Office of the Assistant Secretary of Defense, International Security Affairs, European Region

Department of State

Assistant Secretary for European Affairs
Assistant Secretary for Inter-American Affairs
Agency for International Development

Department of Housing and Urban Development

Assistant to the Secretary for International Affairs

Bilateral Organizations

International Boundary Commission
International Boundary and Water Commission
Joint Mexican-United States Defense Commission
Permanent Joint Board on Defense-U.S. and Canada

NOTE: List of agencies and offices compiled by GAO.

ENCLOSURE II

## NATURE OF AGENCIES' PROGRAMS OR INTERESTS WITH CANADA AND/OR MEXICO--AS REPORTED BY THE AGENCIES

### INDEPENDENT AGENCIES

**American Battle Monuments Com.**

Operates and maintains a closed cemetery at Mexico City. There have been no burials since 1923. (M)

**Civil Aeronautics Board**

The international aviation policy of Canada, Mexico or any country determines to a large extent whether or not the U.S. can successfully negotiate a liberal pro-competitive aviation bilateral agreement with that country. Although the U.S. has agreements with both countries, it is concerned about their more restrictive aviation policies.

**Environmental Protection Agency**

Coordinates its activities with the International Joint Commission as they apply to boundary issues and especially environmental issues associated with the Great Lakes. (C)

Coordinates World Health Organization, Pan-American Health Organization, etc., activities as they apply to water and air quality at the boundary. (M)

**Federal Communications Com.**

Frequency management. (C) & (M)

**International Communication Agency**

To explain U.S. foreign and economic policy; to facilitate informational, educational and cultural intercourse; to assess and advise on the impact of American foreign and economic policy decisions in the two countries. (C) & (M)

**Inter-American Foundation**

To be responsive to the efforts of local, non-governmental groups in Mexico formed to solve basic social and economic problems. (M)

**Interstate Commerce Com.**

Concerned with developing compatible policies in regard to motor carrier regulation at the Federal and Provincial level. Receives and answers inquiries about the agency's regulatory policies raised by Canadian motor carriers wishing to operate in the U.S. In addition, concerned with rail service matters, such as freight car supply. (C)

Receives occasional inquiries from Mexican motor carriers about the agency's policies. Also, rail service matters are of interest. (M)

Federal Maritime Com.

Harmonizing transportation policies, particularly through movements originating in one country and passing through the other. (C) & (M)

Overseas Private Investment Corp.

Discusses policies and procedures with its Canadian counterpart, the Export Development Corp. at Ottawa. (C)

U.S. International Trade Com.

Primary interest is in policies and activities which affect bilateral trade with Canada and Mexico in products subject to the Commission's investigations and studies. (C) & (M)

U.S. Arms Control and Disarmament Agency

Coordinates with Canadian counterpart the theater nuclear and SALT policies within the NATO alliance structure; consults on entire range of arms control and disarmament negotiations and issues concerning the Committee on Disarmament. (C)

Interested in nuclear technology developments, uranium mining, science and technology, nonproliferation policy, regional influence on nuclear issues, Treaty of Tlatelolco, OPANAL, and alternate energy systems. Also, weapons policy, conventional arms acquisition and restraint in Latin America. (M)

Office of the Special Representative for Trade Negotiations

Trade Policy. (C) & (M)

Export-Import Bank of the U.S.

Level of import demand. (C) & (M)

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institute on Alcohol Abuse & Alcoholism

Policies and programs relating to alcohol use and alcoholic-related problems, including alcoholism. (C) & (M)

National Institute on Drug Abuse

International cooperation and information exchange in the area of drug abuse. (C) & (M)

National Institute of Mental Health

Mental health delivery system; mental health training programs research policies. (C) & (M)

DEPARTMENT OF THE INTERIOR

U.S. Fish & Wildlife Service

Management, research, and conservation of migratory wildlife. Joint preparation of waterfowl hunting regulations. Mitigation of adverse effects of development on both sides of border for migratory and endangered wildlife. (C) & (M)

Bureau of Mines

Mine and mineral research; production and shipments of minerals and minerals materials; reserves of minerals; planning for priorities, allocations of resources in emergencies and disasters; transportation and trade affecting minerals. (C) & (M)

Geological Survey

Mineral resources, radioactive waste disposal, hydrology, topography, nuclear raw materials, marine geology, and energy. (C) & M)

DEPARTMENT OF JUSTICE

Drug Enforcement Admin.

Primary interest is the law enforcement activities as they relate to international drug trafficking. (C)

Primary interest is the law enforcement activities and policies to reduce the flow of drugs to the U.S. (M)

Immigration and Naturalization Ser.

The establishment, operation, and maintenance of preclearance locations (airports) within Canada where alien applicants for admission to the U.S. are preclearanced in Canada. Necessary liaison in conjunction with the deportation of aliens to Canada and identification of smuggling activites from Canada to the U.S. (C)

Necessary liaison in conjunction with the return and/or deportation of aliens to Mexico; identification of smuggling activities from Mexico to the U.S.; activities of potential illegal entrants to the U.S.

DEPARTMENT OF AGRICULTURE

Foreign Agricultural Ser.

Interested in policies and activities that pertain to agricultural programs, exports and imports, production, subsidies, tariffs, and nontariff barriers. (C) & (M)

Economic, Statistics, and Cooperatives Ser.

Interested in policy related activities that impact or have potential of impacting on U.S. and world trade. (C) & (M)

Federal Grain Inspec. Ser.

Grain grading, weighing, marketing and utilization. (C) & (M)

Office of the Gen. Sales Mgr.

Competing exporter of wheat and barley. Also grain export policies and activities as they may affect decisions in U.S. export programs. (C)

Buyer of U.S. agricultural commodities. (M)

Soil Conservation Ser.

Soil and water conservation activities in Ontario that affect the Great Lakes for which the U.S. share a common interest. (C)

International drainages and streams are impacted by land and water utilization in upstream areas. Joint use of Rio Grande and Colorado River waters. (M)

Food Safety and Quality Ser.

Monitoring policies and procedures for importing and exporting meat, poultry, fresh fruits and vegetables, and assuring compliance with U.S. requirements. (C) & (M)

Forest Service

Log and lumber trade, forest protection, environment, recreation and tourism, pulp and paper supplies. (C) & (M)

Science & Education Admin.

Interested in research planning and coordinating research activities. (C)

Has a number of research projects that are cooperative with scientists in Mexico, and cooperates with research aspects of action programs in suppression of screwworms and medflies.

Plant Protection & Quarantine

Concerned with development and implementation of PPQ programs relative to agricultural pests of mutual concern and components appropriate to international plant quarantine. (C)

PPQ functions cooperatively under a Memo of Understanding with shared planning, funding and implementation. Work is carried out against plant pests under authority of the Organic Act of 1944, as amended. (M)

Veterinary Services

Interest lies in animal disease eradication programs conducted in Canada, and activities to prevent introduction of foreign animal diseases. (C)

Cooperative Screwworm Eradication Program is primary interest, however, VS is also concerned with Mexican efforts to eradicate existing animal disease and prevent introduction of foreign animal diseases. (M)

Federal Crop Ins. Corp. Office of the Mgr.

To be advised of the progress of the crop insurance program in the two countries; assist the U.S. with visiting foreign crop insurance officials. (C) & (M)

Office of Governmental & Public Affairs

GPA is the information arm of USDA. International information prepared and distributed by GPA, when the occasion is appropriate, is affected by policies and programs of other governments. (C) & (M)

Attorney General--Secretariat for Agric. Com. of Customs

Pest eradication; animal disease control; agricultural products entering the U.S.; distribution of food commodities in Mexico. (M)

Office of International Cooperation and Development

Agricultural policies with special reference to work with international organizations concerned with this area. (C)

Primary interest is designed to expand interchange of information, develop scientific exchanges and joint research in areas of mutual concern. Also concerned with agricultural policies relating to international organizations. (M)

DEPARTMENT OF ENERGY

Energy Information Admin.

To understand the energy policies and statistics. (C) & (M)

Assistant Secretary for International Affairs

Interested in Canada's energy policies, both domestic and foreign, in regard to natural gas, electricity, nuclear, and coal. (C)

Concerned with the entire range of Mexican energy policies, both domestic and foreign, in regard to coal, oil, gas, nuclear, solar, research, etc. (M)

DEPARTMENT OF TRANSPORTATION

Federal Aviation Admin.

International standardization of aviation operational and technical standards; coordination of airspace management along borders. (C) & (M)

Federal Highway Admin.

Interested in the inspections of foreign motor carriers and operators licensed to operate within the U.S. to assure they meet U.S. safety regulations. (C) & (M)

Research & Spec. Programs Admin.

Cooperation in documentation simplification and electronic interchange of trade and transport data in transborder and international trade. Maintenance of preclearance for U.S. airline service from Canada to U.S. Also, interested in transportation R & D in Canada. (C)

Facilitation of transborder trade and transport. (M)

St. Lawrence Seaway Devel. Corp.

Seaway tolls, from which all revenues of the Seaway Corp. are derived are established through binational negotiations with Canada. Canadian policies on transportation user charges therefore have a direct affect on U.S. revenues. Canadian policy regarding ship safety, environmental matters, pilotage, and internal transportation policies all affect U.S. operations. (C)

DEPARTMENT OF THE TREASURY

Bureau of the Mint

Technical information exchange with Mexican and Royal Canadian Mints is subject of most contacts. (C) & (M)

U.S. Customs Service

U.S. preclearance facilities at Canadian airports; Canadian Customs/RCMP laws re: narcotics interdiction international cargo/passenger traffic and mutual border concerns, such as law enforcement, terrorism, air/land/sea carriers. (C)

Exchange of information under terms of U.S./Mexican Customs/Federal police laws re: narcotics interdiction, international cargo/passenger traffic, air/land/sea carriers; alien smuggling problem along border. (M)

Bureau of Alcohol, Tobacco and Firearms

Law enforcement regarding firearms, explosives and alcohol. (C) & (M)

Office of Developing Nations Finance

Macroeconomic policies, balance of payments developments, capital flows, exchange rates, tax issues, trade and investment policies. (M)

U.S. Secret Service

Protective intelligence information, security arrangements for protectee visits, and counterfeiting of U.S. currency. (C) & (M)

DEPARTMENT OF COMMERCE

U.S. Travel Service

Interested in those policies within Canada and Mexico which relate to the U.S. to promote travel among the countries. (C) & (M)

Economic Devel. Admin.

The Administration enters into joint planning and projects for mutual economic development with local communities/commercial industrial enterprises and private citizens. Such planning/projects are located along the Mexican and Canadian borders. (M)

Bureau of Export Devel.

Policies which affect trade and investment interests of U.S. business are the Bureau's concern in providing business counseling. (C)

Mexican Government policies which affect trade and investment. Also activities of the private business sector in industrial expansion, purchase of exports and the acquisition of technology. (M)

Bureau of International Economic Policy and Research

Increase competitiveness of U.S. products and services; improve environment for U.S. sales and investment abroad; safeguard domestic market against unfair trade practices of other nations; maintain U.S. access to necessary commodities in world markets. (C) & (M)

DEPARTMENT OF DEFENSE

Dept. of the Air Force

Cooperation in defense matters of concern to both the U.S. and Canada, e.g., North American Air Defense, NATO, basing rights, etc. (C)

Defense matters (armaments, modernization of force exchange position, energy, overflight, search and rescue). Arms limitations and nonproliferation of nuclear weapons. (M)

Dept. of the Army

Interested in the American-British Canadian-Australian joint military standardization programs; U.S.-Canadian Defense

Development Training program; joint military development projects; NATO, PJBD, MCC, CUSRPG. (C)

To improve military-to-military relations. (M)

Dept. of the Navy

Interested in the defense budget; defense improvement programs; contribution and participation in NORAD; contribution to NATO; combined defense of North America. (C)

Interested in the defense budget; defense programs; trends in direction and stability in government, related to the U.S. southern border security. (M)

Operations Directorate, Defense Security Assist. Agency

The agency interests are determined by the Canadian Government policies/activities concerning the acquisition by the purchase or production of U.S. defense articles and services. (C)

Office of the Assistant Secretary of Defense, International Security Affairs, Inter-American Region

Arms transfers, military-to-military relationships, general defense matters, energy, and arms limitation initiatives. (M)

Office of the Assistant Secretary of Defense, International Security Affairs, European Region

Primary DOD coordinator and export adviser on Canada in political, military and economic matters. Interests include all issues of national defense, bilateral relations with U.S. and participation in NATO.

DEPARTMENT OF STATE

Assistant Secretary for European Affairs

Bureau of European Affairs (Office of Canadian Affairs) is charged with the formulation and execution of U.S. foreign policy toward Canada, involving a wide range of bilateral and global issues. (C)

Agency for International Development

Coordination of aid policies and programs. (C)

Support of joint biochemical, operations research, and other research conducted by the agency contractors and grantees. (M)

Bureau of Inter-American Affairs

Interested in a broad range of Mexican policies and develop-

ments, with special interests in energy (oil and gas), trade, Mexico's economic development, migration, and border relations. (M)

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Assist. to the Secretary for International Affairs

Interested in Canadian policies and programs in: housing, mortgage assistance, taxes, energy conservation, community revitalization, public housing management and special programs. (C)

Interested in sharing data on urban planning and to encourage Mexican planners to adopt comparable methodologies. (M)

BILATERAL ORGANIZATIONS

International Boundary Com.

To maintain an effective boundary between the U.S. and Canada including the maintenance of a survey system, monument system and a clear vista. (C)

International Boundary and Water Com.

The Mexican Section of the Commission coordinates international water and boundary activities within its territory, requiring the joint action of the U.S. and Mexico through the Commission.

Joint Mexican-U.S. Defense Com.

Mutual defense of the United States and Mexico. (M)

U.S. Permanent Joint Board on Defense

The Board is a consultative group which meets three times a year to consider politico-military issues. (C)

DEPARTMENT OF LABOR

Bureau of Labor Statistics

Exchanges information about labor statistics programs. (C)

Provides training and other technical assistance in labor statistics programs. (M)

NOTE: (C) - Canada
(M) - Mexico

ENCLOSURE III

## AGENCIES WITH RESEARCH PROGRAMS CONCERNING CANADA AND/OR MEXICO--AS REPORTED BY THE AGENCIES

### INDEPENDENT AGENCIES

#### Environmental Protection Agency

Environmental studies such as water quality, industrial pollution, etc. (C)

Joint National Science Foundation efforts over wide range of subjects covering health, air and water quality, and agriculture. (M)

#### International Communication Agency

Periodic studies of public opinion for the purpose of measuring opinions related to bilateral issues affecting U.S.-Mexican relations. (M)

#### U.S. Arms Control and Disarmament Agency

None at this time, however, in the past joint nuclear safeguards research has been conducted and may do some again in the future. (C)

#### U.S. International Trade Com.

Collection of economic data on industries or individual firms where needed in connection with investigations. (C) & (M)

### DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

#### National Institute on Alcohol Abuse & Alcoholism

Collaborative project through the World Health Organization, related to improving response to alcohol problems. (C) & (M)

#### National Institute on Drug Abuse

Biomedical and pharmacological research. (C)

#### National Institute of Mental Health

Anthropological and social sciences research. (M)

### DEPARTMENT OF THE INTERIOR

#### U.S. Fish & Wildlife Service

Joint research on endangered species, their habitats, and research on migratory waterfowl populations. (C) & (M)

#### Bureau of Mines

Some cooperative programs, extensive exchanges of data and research results. (C) & (M)

#### Geological Survey

Cooperative studies in topography. (C)

Cooperative studies in marine geology. (M)

DEPARTMENT OF AGRICULTURE

Foreign Agricultural Service

Issues reports on commodities, production, trade, agricultural policy, etc. (C) & (M)

Economics, Statistics, and Cooperatives Service

Conducts research on economic issues related to agricultural commodities. (C) & (M)

Soil Conservation Service

Shares research information routinely. (C)

Forest Service

Forest products research. (C)

Reforestation-hydrology research. (M)

Science & Education Admin.

Limited to joint participation in workshops, program reviews, and personnel exchanges. (C)

Biology and ecology of dung bettle; Spittlebug resistance in grasses; winter nursery for cotton breeding; control of Mediterranean fruit flies; control of Alfombrilla; grape diseases. (M)

Veterinary Services

Development of improvements in the joint Screwworm Eradication Program. (C)

Attorney General-Secretariat for Agric. Com. of Customs

Pest eradication, animal disease control, and the U.S.-Mexico cooperative program. (M)

Office of International Cooperation and Development

Currently developing joint research programs in new crops, desertification, soil and water conservation, improving productivity of livestock and convention crops. (M)

DEPARTMENT OF TRANSPORTATION

Federal Aviation Admin.

Participates in a program involving use of a uniquely instrumented Canadian helicopter to determine its performance characteristics. (C)

Federal Highway Admin.

Information exchange on highway related to R & D projects. (C)

Research & Special Programs Admin.

Government-industry project on electronic data interchange in transborder trade. (C)

DEPARTMENT OF COMMERCE

U.S. Travel Service

Jointly funded study of the Canadian vacation market, with specific analysis of vacation travel to the U.S. (C)

Consumer survey of the Mexican international travel market. (M)

Bureau of Export Devel.

Conducts market research on approximately 6 industrial product categories believed to have the best prospects for exporting to Mexico. (M)

Bureau of International Economic Policy and Research

Considerable research related to policy issues. (C) & (M)

DEPARTMENT OF DEFENSE

Dept. of the Air Force

Defense related. (C)

Dept. of the Army

Military material projects. (C)

Dept. of the Navy

Primarily restricted to pure research projects with Canadian universities. (C)

Office of the Assistant Secretary of Defense, International Security Affairs. Inter-American Region

Occasional scientific programs, e.g., oceanographic research.

DEPARTMENT OF STATE

Assistant Secretary for European Affairs

Occasional programs, approved by Department of State's Office of External Research. (C)

Bureau of Inter-American Affairs

Sponsors a number of studies on Mexican policy. (M).

Agency for International Development

Limited support of joint biochemical, operations research, and other research conducted by AID contractors and grantees. (M)

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Assistant to the Secretary for International Affairs

Joint research in housing rehabilitation survey techniques, mobile home standards, mortgage loan process, etc. (C)

Economic input-output study of San Diego and Tijuana. (M)

DEPARTMENT OF LABOR

Bureau of Labor Statistics

Conducts comparative productivity studies on costs and unemployment rates. (C)

BILATERAL ORGANIZATION

International Boundary and Water Commission

Coordinates international water and boundary investigations in Mexico. (M)

NOTE: (C) - Canada
(M) - Mexico

ENCLOSURE IV

## CONSULTATIVE MECHANISM WORKING GROUPS WITH MEXICO

| Trade | Energy | Migration | Border |
|---|---|---|---|
| Commerce | Treasury | HEW | Commerce |
| Treasury | AID | Labor | Treasury |
| Labor | State | Justice | HEW |
| Agriculture | N.S.C. | AID | ICA |
| S.T.R. | O.S.T.P. | Dom. Ad. | HUD |
| N.S.C. | Energy | Select. Com. | Dom. Ad. |
| State | DOD | State | State |

| Finance Industry Development* | Law Enforcement | Tourism | Inter-Agency Group |
|---|---|---|---|
| Commerce | Treasury | Commerce | Commerce |
| Treasury | Justice | Treasury | Treasury |
| Labor | State | ICA | HEW |
| AID | | Dom. Ad. | Labor |
| N.S.C. | Political | State | ICA |
| State | | | HUD |
| Fed. Res. | State | | AID |
| | | | O.S.T.P. |
| | | | State |
| | | | Energy |

* The Government of Mexico has insisted that this Working Group be divided into two groups; the Finance Working Group and the Industry Working Group with no reference to development. The U.S. participation will remain essentially the same for both groups.

### ABBREVIATIONS

| | |
|---|---|
| AID | Agency for International Development |
| Dom. Ad. | Office of the Domestic Adviser |
| Fed. Res. | Federal Reserve |
| HEW | Dept. of Health, Education, and Welfare |
| HUD | Dept. of Housing and Urban Development |
| ICA | International Communication Agency |
| N.S.C. | National Security Council |
| O.S.T.P. | Office of Science and Technology Policy |
| Select. Com. | Select. Com. on Immigration and Refugees |
| S.T.R | Office of the Special Representative for Trade Negotiations |

ENCLOSURE V

2255

THE WHITE HOUSE

WASHINGTON

April 26, 1979

MEMORANDUM FOR: THE SECRETARY OF STATE
THE SECRETARY OF THE TREASURY
THE SECRETARY OF DEFENSE
THE ATTORNEY GENERAL
THE SECRETARY OF THE INTERIOR
THE SECRETARY OF AGRICULTURE
THE SECRETARY OF COMMERCE
THE SECRETARY OF LABOR
THE SECRETARY OF HEALTH, EDUCATION AND WELFARE
THE SECRETARY OF ENERGY
THE ADMINISTRATOR OF THE AGENCY FOR INTERNATIONAL DEVELOPMENT
THE DIRECTOR OF THE OFFICE OF MANAGEMENT AND BUDGET
THE ASSISTANT TO THE PRESIDENT FOR NATIONAL SECURITY AFFAIRS
THE ASSISTANT TO THE PRESIDENT FOR DOMESTIC AFFAIRS AND POLICY
THE DIRECTOR OF THE OFFICE OF SCIENCE AND TECHNOLOGY POLICY
THE SPECIAL REPRESENTATIVE FOR TRADE NEGOTIATIONS

FROM: THE PRESIDENT J.C.

SUBJECT: Coordination of United States policy toward Mexico

In view of the increasing domestic and international importance of our relations with Mexico, and of the intensity and complexity of those relations in the years ahead, I have decided to take steps to improve our ability to address effectively all issues which affect U.S. relations with Mexico.

To ensure that all U.S. policies toward Mexico, and all actions directly or indirectly affecting Mexico, promote basic U.S. national interests and are consistent with our overall policy toward Mexico, I ask:

— that each of you accord a high priority to any and all matters within your jurisdiction affecting Mexico, consciously giving good relations with Mexico a continuing high priority in your thinking and planning; and

-- that all proposed actions, which have an effect on Mexico, be carefully coordinated so as to be consistent with overall U.S. policy toward Mexico, and based on the fullest possible prior consultation with the Government of Mexico.

To achieve this fundamental Administration-wide objective of establishing a sound, long-term relationship with Mexico, I hereby direct the following measures:

1. U.S. Coordinator for Mexican Affairs

I am nominating Robert Krueger as Ambassador-at-Large and United States Coordinator for Mexican Affairs to assist me and the Secretary of State in the development of effective national policies toward Mexico and in the coordination and implementation of such policies. Mr. Krueger will also serve as Chairman of a new Senior Interagency Group on U.S. policy toward Mexico and as U.S. Executive Director for the U.S.-Mexico Consultative Mechanism.

As U.S. Coordinator, he will be responsible for ensuring that U.S. policies toward Mexico, and all other U.S. activities which affect Mexico, are developed and conducted in a coherent, flexible manner and are fully consistent with our overall policy objectives towards Mexico. More specifically, Mr. Krueger will be responsible, to the fullest extent permitted by law, for:

-- Development and formulation of United States policy toward Mexico;

-- Review and coordination of any and all U.S. Government programs and activities that affect U.S.-Mexican relations, whether directly or indirectly;

-- Management of U.S. participation in the working groups established under the U.S.-Mexico Consultative Mechanism, ensuring also that any existing overlapping entities are integrated into the process or altered as may be necessary to avoid duplication;

-- Advice to myself, the Secretary of State and other Cabinet officers and Agency Heads and the U.S. Ambassador to Mexico on the effects of contemplated actions by any agency of the Government on our relations with Mexico; and,

-- Initiation of reports and recommendations for appropriate courses of action, including periodic reports to me on major developments and issues.

The Coordinator will be located in the Department of State. The Director, Office of Mexican Affairs, Department of State, will serve as Deputy Coordinator. The Coordinator's staff may include personnel assigned on non-reimbursable details from other agencies and departments.

2. Senior Interagency Group on U.S. Policy Toward Mexico

I am establishing a Senior Interagency Group on U.S. Policy towards Mexico to be chaired by the U.S. Coordinator, to assist in the development, review and coordination of U.S. policies toward Mexico and other U.S. activities or policies which might affect U.S.-Mexican relations. Committee members will include representatives from: Agriculture, Commerce, Defense, Energy, Interior, Justice, Labor, State, Treasury, Agency for International Development, Office of the Special Representative for Trade Negotiations, National Security Council, Domestic Policy Staff, Office of Science and Technology Policy and other agencies as necessary. Representation will be at the level of Assistant Secretary or above. I ask that you designate promptly the senior official who will serve as your representative on the Interagency Group and that you take a personal and continuing interest in these matters.

3. Consultation

The first and most important agreement the President of Mexico and I recently reached was to consult closely in the development and implemention of all policies and activities affecting both countries.

It is my firm intention to meet this commitment. The primary instrument will be the U.S.-Mexico Consultative Mechanism, which President López Portillo and I agreed to strengthen. The Secretary of State will continue to chair the Consultative Mechanism for the United States. The new Coordinator will serve as its Executive Director.

To rationalize our work and assure that all issues are addressed in timely fashion, we have agreed with the Government of Mexico to restructure the Consultative Mechanism, based on eight joint working groups, at the sub-Cabinet level, covering: Trade, Tourism, Migration, Border Cooperation, Law Enforcement, Energy, Finance-Industry-Development, and Multilateral Consultations. The Mixed Commission on Science and Technology will also function under the Consultative Mechanism. Secretary Vance has been in touch with you directly on plans for organizing and implementing these working groups.

* * * * *

I ask that you provide full cooperation and assistance to Secretary Vance and Mr. Krueger in carrying out their responsibilities. The strengthening of policy coordination, and of U.S. relations with Mexico, is an important domestic as well as foreign policy priority.

Senator BAUCUS. These hearings could result in proposals and legislation of keen interest to this country as well as to our neighbors. I hope to have a full understanding of how we can, as a nation and as a continent, better achieve our potential. In the interim, I call your attention to the following:

One, it is in this Nation's interest to establish separate bureaus for North America in the Departments of State and Commerce and other agencies. I am delighted to learn that the Department of Commerce may adopt my recommendation, and at present is considering creation of just such a bureau. I hope we may look forward to working with it.

Two, I regret that the duties for the newly-confirmed Ambassador-at-Large, Robert Krueger, were confined to Mexico alone. We now have two Ambassadors to Mexico, and although Ambassador Krueger's role will be to coordinate U.S. agency programs with Mexico, I think U.S. interests would have been better served if he were to coordinate United States/Canadian/Mexican relations. I shall continue to press for such a coordinator.

Three, the United States needs to be more aggressive in its trade policy, and toward this end I will be investigating the implications of investment and other tax incentives for American businesses wishing to establish or to expand their North American operations.

Four, already it is clear to me that the peoples of North America lack a clear understanding of each other. Accordingly, I hope to investigate the possibility of establishing a Fulbright-Hayes type of fellowship program for North America.

Five, the United States should conclude air quality agreements with both Canada and Mexico. If this is not accomplished soon, I fear the consequences of not being able to do so in the future.

Six, the private sector is in an excellent position to take a lead in improving trade, and I intend to encourage their leadership. Currently, I am exploring the possibility of creating a private sector institute to address these issues and to propose solutions.

Necessarily, I will be probing for more information and will be making additional recommendations. I am seeking the type of information which will help our respective governments to implement better policies. This will require us to look at our problems and opportunities from a number of perspectives.

And lastly, I am pleased to announce that I hope to hold the next North American interdependence hearing in Albuquerque, N. Mex. on December 8.

Beginning this morning, we will have two lead-off witnesses. The first will be Senator Domenici and Senator van Roggen.

Senator Domenici, from the U.S. Senate, I understand Senator Domenici is on his way over. He just arrived at his office. The downpour last night flooded a few overpasses and underpasses. He was late getting here.

Senator van Roggen, who is a senator from British Columbia, Canada, asked to be here. He is very interested in United States-Canadian relations. In fact, based on my experience the few times I have been in Canada attending various meetings, I found Senator van Roggen probably to be Canada's leading authority on the United States-Canadian affairs.

He is very, very knowlegeable, has been involved in the area for a long period of time. He has chaired many hearings on the subject.

He is a member of the Canadian Foreign Affairs Committee in Canada and we are delighted to have him here with us today.

Pending the arrival of Senator Domenici, Senator van Roggen, why do you not begin and proceed in any manner that you wish?

As soon as you finish, and Senator Domenici is here, we will hear from him as well.

We are very happy to have you here. I am very impressed with your work, and I am delighted to hear what you have to say.

## STATEMENT OF HON. GEORGE CLIFFORD VAN ROGGEN, CANADIAN SENATOR FROM BRITISH COLUMBIA

Senator VAN ROGGEN. Thank you, Mr. Chairman.

Mr. Chairman, possibly, apart from thanking you for this opportunity to appear before your committee to discuss matters relative to United States-Canada trade, I should emphasize I am appearing here today in a personal capacity and in no way speak on behalf of the Government of Canada.

The Senate Foreign Affairs Committee, of which I have the honor to be chairman, has been conducting a study of Canada-United States relations for 4 years now and will be continuing to do so.

In August 1978, we published volume 2 of our report. That volume was to deal with Canada-United States trade in particular and while it had a number of recommendations in it, the final recommendation, and the one which has caused some comment and controversy, read as follows:

> The Committee urges governments in Canada, as well as the business and labor communities, to assess without prejudice Canada's present economic progress, the alternative solutions and their consequences.
>
> The Committee recommends that they consider seriously the option of bilateral free trade with the United States.

I wonder if I might be forgiven for a few minutes this morning to give you some statistical facts and background on trade so that you will understand the problem, if possible, through Canadian eyes. I think there is, sometime, a very understandable tendency in the United States, our friendship and relationship having been of such long standing, not always to appreciate that Canada, because of our population of only a tenth yours and generally an economic machine that is only a tenth of yours in power, has to look at things somewhat differently than you do.

I think it may be profitable this morning for the record if I simply put some facts forward that will help you view some of these problems through Canadian eyes. I am fully aware of the importance that you in the United States place on your trade, but to put this in perspective from a Canadian point of view, I should point out that Canada's exports approach 25 percent of our gross national product. In your case, it is 7 percent.

This is equaled, of course, by our imports and amounts to over $50 billion a year. Of this immense trade, 70 percent is with the United States; 10 percent with Europe; 6 percent with Japan, leaving only 14 percent for our trade with the rest of the world, including our large wheat sales to Russia and China.

I am not suggesting that we in Canada should ignore export opportunities to Third World countries, but the vast majority of our trade will continue to be with the United States and the rest of the industrialized world for at least the foreseeable future.

I hardly need describe to you what this industrialized world is that we do 86 percent or 87 percent of our trade with. It consists of the United States, of course, with over 225 million people in the home market, truly a trading block of its own; a Europe consisting of over 300 million highly skilled people, the majority of whom are united in 9 nations, now 10, with Greece, of the European Community, and the remainder of whom live in countries—this is important—which, without exception, have entered into free trade agreements with the European Community and collectively form the world's largest trading block.

Japan, with a 100 million people in the home market, with an imperative—I repeat, an imperative, not a choice, because of almost total lack of resources or food or energy at home of remaining totally competitive and thus providing for its production runs a total market both at home and abroad equivalent to that of the United States or Europe. Then, if you add to this equation the new Japans of South Korea, Taiwan, Singapore, Hong Kong and many more to come, pouring out an endless volume of items which only 10 or 15 years ago might have been considered high technology items, that are today low technology items with labor costs that we in Canada cannot possibly compete with if we are to maintain our standard of living, and then couple that in turn with the general picture, with the overall reduction in tariff protection—and Canada was built on tariff protection in the manufacturing sector in the Kennedy Round, and then place on top of that the further reductions of the recently completed Tokyo Round at the GATT and you have Canada as odd man out and the worst of both possible worlds, with the small domestic market and with tariffs too low to be effective and not belonging to any of the three great trading areas, or blocks, that I mentioned.

Let there be no mistake—I am bullish on Canada, but the time has come when we can no longer afford the luxury of relying on our great natural wealth as a substitute for hard economic thinking and when we must stop trying to manufacture one of everything and, instead, concentrate on our areas of natural advantage.

Now, let me attempt a very brief overview of Canada's situation today, using rounded figures, and you will see that we have a problem that we must address.

First, a large resource sector in forestry, minerals, energy, and agriculture in which we have a favorable balance of trade, in excess of $14 billion a year. A manufacturing sector developed in large measure in response to our tariff policy to serve the small Canadian market only in which we have an unfavorable balance of trade in excess of $12 billion. A chronic inbalance of payments in invisibles of approximately $9 billion a year, leaving Canada with a net inbalance of payments—this year, it is estimated to be $7 billion.

Of this total inbalance of trade, including invisibles of $7 billion, our unfavorable balance of trade with the United States is almost $5 billion. To put some of these figures in perspective, I would

point out to you that our inbalance of payments overall on a per capita basis is greater than your total outflow for OPEC oil and while you consider your current account deficit with Japan of approximately $11 billion to be intolerable, our balance of payments deficit with the United States is such that on a per capita basis it would be the equivalent of your having an inbalance with Japan of some $50 billion.

In other words, Canada's unfavorable balance of payments with the United States is almost five times as serious for Canada on a per capita basis as your inbalance with Japan. I am sure that you will agree that such a situation cannot continue indefinitely.

One might, here, include in the above picture Canadian concern with the highest degree of foreign ownership and control in the world, which we cannot begin to address until we halt our balance of payments and stop borrowing on savings of foreigners, or selling off the back 40 to cover same.

As a result of the Economic Council of Canada's report, my Senate committee report, the C. D. Howe Research Institute, the statement of the new Minister of Finance, Mr. Crosby, made after the Tokyo Summit, and the position of a number of different individuals knowledgeable in the field, all supporting Canada-United States free trade, or the study of it, the subject has come to the fore and instead of being a complete no-no, as was the case 10-years ago, one is now permitted to discuss it in polite society.

The thinking underlying support for Canada-United States free trade is that it would lead to a rationalization of the fragmented Canadian manufacturing sector and provide access to a market as large as that of our competitors in the United States, Europe, and Japan, thus reducing our $12 billion inbalance in manufacturing goods and bring our overall inbalance over long.

Unfortunately, these developments have been coupled by a good deal of uninformed rhetoric by many who should know better on both sides of the border, and many in Canada who criticize free trade proposals, not for what they are, but for what they are not, which brings me to the subject I wanted to stress this morning, if I may take a few more minutes, and that is what free trade is not.

I might say a number of headlines in Canadian papers have highlighted statements by leading American figures in recent months on using terms such as common market, free trade area, and continentalism as interchangeable terms. I would submit that a Canada-United States free trade agreement is not a North American common market, it is not a Canada-United States common market, it is not a proposal for sharing of natural resources. It is not a proposal for the pooling of energy supplies. It is not a proposal for political integration. It is not a form of continentalism, if that word is used in its pejorative sense, rather than in the context of mutual cooperation.

Proposals for a Canada-United States free trade agreement are simply aimed at strengthening the Canadian manufacturing sector by rationalizing it over a period of time. In the context of today's situation where it has lost its traditional high tariff protection and, as I said earlier, it is facing the worst of both possible worlds.

I know I do not need to explain the difference between the common market and a free trade area to yourself, Mr. Chairman,

53-231 O - 79 - 3

but I think for the record that I might just take these new two paragraphs from my statement.

A common market, or customs union, as represented by the European Community under the Treaty of Rome involves free movement of goods, labor and capital between the member states who agree at the same time to be bound by a common external tariff against the rest of the world and who agree to the harmonization of nontariff barriers and a host of other matters not only as between themselves but in their relations with the outside world.

In addition, the Treaty of Rome specifically contemplates a degree of political cooperation—as evidenced by the recent direct elections to the European Community Parliament—even if not full political union. The hesitancy of some nations to join the European Community as was the case with Great Britain is that in so doing they indeed give up a real degree of national sovereignty.

I might just mention as recently as the Hague summit of the European Community heads of government, it was agreed, although not yet accomplished, that fiscal and monetary union now be included in the goals, so they have gone a step beyond even a Customs Union.

These characteristics are not involved in the free trade agreements entered into between the other European nations and the European Community, such as the free trade agreements entered into between Finland, Sweden, Norway, Austria, Switzerland, Portugal, et cetera. Nor would they be, I would submit, in such an agreement between Canada and the United States.

To comply with GATT, it would simply be an agreement removing the remaining tariffs between the two countries on "substantially" all of the trade—we are already at a quite substantially high level—over a "reasonable" length of time, typically 10 years, in a given "sector"—in this case, manufacturing.

Such an agreement would provide a policing mechanism for nontariff barriers as between the two countries but would have no bearing on external tariffs or on tariff bariers that either country might wish to employ relative to the outside world.

There are other fundamental differences between a free trade proposal and a common market. Such a free trade agreement would have no bearing on our mineral, or other, resources, which we could export or not as we chose, but I remind you that they are not, generally speaking, subject to tariffs at the moment and our trade in those is very intensive with you.

Oil, natural gas, electricity, et cetera. Energy, generally, those items are not the subject of tariffs and would continue to be subject to exactly the same regulatory authorities and permits as they are today. If we followed the European example, agriculture, including fisheries, would not be included in such an agreement even where tariffs are concerned and such an exclusion is permitted under the GATT.

I, for one—and I know most Canadians—would wish to continue in mutually satisfactory cooperation in all of these other areas, but this should not be muddled into a discussion of bilateral free trade and manufactured goods.

Mr. Chairman, I have deliberately limited the length of this opening statement. I have not attempted to deal with the many

questions that I can imagine you may have. I trust you will not hesitate to raise with me any concerns in what I consider to be a very important subject.

Thank you.

Senator BAUCUS. Thank you very much, Senator van Roggen. Do you have a longer statement you would like to include in the record?

Senator VAN ROGGEN. Not really. I have a longer speech on the subject, but a lot of it is not too relevant. This is the essence of it, as far as this part of the discussion is concerned.

Senator BAUCUS. If you could suspend for a minute and Senator Domenici is here this morning.

Senator, why do you not give your statement? I would like to stay, if you possibly can. Perhaps we can get an interchange here, depending on your schedule.

Welcome here this morning. Senator Domenici has been one of the Senators in the forefront of trying to develop mutual understanding, better mutual understanding in North America. As the Senator from the State of New Mexico, you have been directly involved in relations with the Mexican Government and all the problems that Mexico and the United States have.

In addition to that, Senator Domenici is trying to find greater North American cooperation, too. I want to thank you, Senator, for your help.

[The prepared statement of Hon. Pete V. Domenici follows:]

STATEMENT OF SENATOR PETE V. DOMENICI

Thank you, Mr. Chairman. First, I would like to express my appreciation for the opportunity to speak on the topic of North American Interdependence. I am confident that the hearings you are holding will play a crucial role in the development and strengthening of a special and mutually beneficial relationship between the United States, Mexico and Canada.

As usual, we have too many hearings at once and I have to attend another hearing scheduled at this time by the Energy Committee. If it pleases the committee, I plan to only make some brief opening remarks and, at a later date, submit for the record a more complete statement.

As the Chairman knows, I truly believe that North American Interdependence is a concept for which the time has arrived and we had best begin seeking to find new and better ways of mutual cooperation and coordination of economic opportunities which really can be to everyone's benefit. The United States, Mexico and Canada are in many respects complementary economies and cooperation between the three is necessary if we are to take advantage of that fact. We often take for granted our continental neighbors and do not always recognize problems with our relationships with them. But there are, of course, problems between our three countries—problems that, I am sure, these hearings will address. Because I come from and represent a State that shares a common border and culture with Mexico, it is only natural that I am most familiar with the problems between our country and our southern neighbor.

The first point I'd like to make is general, but it is strongly indicated by history, by Mexican opinion, by analysis of specific problems, and by most of the experts. That is that solutions to identified problems must be sought jointly by United States and Mexican representatives. Whether the problem is the undocumented worker, drug traffic, energy, economic development, or ground water, it is seen as a problem for both countries and hence not soluble unilaterally by one of them. In particular, no solution suggested by us can be effective without Mexican participation in implementation, and that participation will not occur unless the Mexicans have been involved from the start. As an obvious extension of that comment, analyses which lead to a purely Mexican effort to solve the problem (as has sometimes been suggested for the drug traffic) are useless.

A second general point is that the problems are interdependent, so that solutions will be multifaceted. Proposed solutions and laws in support of them which ignore the interdependence will not work.

It is natural that two peoples who share an undefended border of 2,000 miles, share considerable history and culture (especially in the border States), and, willy-nilly, share population, should enjoy a "special relationship" is under renewed discussion, but whatever the outcome of the discussion, the Mexicans have not always enjoyed their relationship with us. If we have forgotten what we call the "Mexican War," the Mexicans have not: It cost them half their territory. I believe a "special relationship" is natural and to encouraged: The consultative mechanism set up by President Carter and President Lopez Portillo in 1977 suggests that the two Presidents do as well, but unilateral actions by the United States vitiate the concept.

I, not unlike the Senator from Montana, am concerned with the lack of coordination and oversight within the U.S. Government of its many programs with Mexico and Canada. If we are to address effectively the problems that exist and are to realize the full potential of North American interdependence, we had first better coordinate existing United States/Mexican/Canadian relations. In the interim, there are several issues that deserve immediate attention:

(1) Foreign convention tax deductibility: You may recall that I brought this to the attention of the committee in the hearing on June 6th. Since 1976, the United States has limited the number of tax deductible business conventions outside the United States to two per year. This law has caused severe losses of revenue to Mexico and Canada; pending legislation would exempt both Mexico and Canada.

(2) Technical and educational exchange programs: It is hard for me to think of better ways to foster a continuing friendship than a program where both human and technical resources and know-how are shared. The private sector and our universities are active in such programs and we should encourage them wholeheartedly.

Mexican rail cars: The United States, as you are all aware, desperately needs rail cars especially "hopper cars." Pending legislation would remove the 18 percent duty assessed on Mexican rail cars since 1978.

(4) Air and water quality agreements: The United States should aggressively pursue and conclude agreements with both Canada and Mexico. The time in which to effectively do so is becoming dangerously restrictive.

I plan to continue to work toward better relationships with Mexico and Canada and am in complete agreement with the approach Senator Baucus and the committee is taking to accomplish the same goal. I expecially want the Senator and the committee to know that I will do all I can to be of assistance and wish to thank them for allowing me to take an active role.

Mr. chairman, I will stop at this point and take any questions you may have.

## STATEMENT OF HON. PETE V. DOMENICI, A SENATOR FROM THE STATE OF NEW MEXICO

Senator DOMENICI. Let me say to you, Mr. Chairman, that I will predict here this morning that what you are doing will become a tremendously important part of the work of Congress, as I see it right now.

I have a prepared statement. I am not going to read it. I ask to introduce it and make it a part of the record.

Senator BAUCUS. We will make it a part of the record.

Senator DOMENICI. I want to use two or three examples of things that I know exist right now that bother our Mexican neighbors immensely. Unless we find a better way to deal with them than the ad hoc way that we have in the past, our relationship with Mexico is not going to improve. We are kidding ourselves if we think that oil or energy is going to bridge a growing gap in terms of commercial understanding, jobs, development of jobs and economic development.

Let me just give you one example and ask you a question. Would you think, if you were a rather poor country beginning to develop, and were on the border of a very affluent country and had decided as a matter of national policy that you would spend a significant

amount of national resources to develop tourism and had a national 10-year plan for the development of that tourism; and if you thought that by developing that tourism, you would put 2 or 3 million people to work, many of whom have been running across the border to find work in that affluent country, and if your projection indicated that 15 to 20 percent of your tourism was going to come from conventioneers from your affluent neighbor, I wonder what you would think about your neighbor if, unexpectedly and all of a sudden, they eliminated the tax deductibility of that kind of convention and thus discouraged conventioneers from visiting your country. You would be led to believe that your affluent neighbor as a matter of policy was attempting to directly undermine your national tourist policy and indirectly your national economy.

I was here when that policy decision was made and while I am not on this committee, or any committee with general jurisdiction, I surmise that we really did not listen to the Mexican people and their government very much before we did that. I would urge that you take the lead in reinstating the same kind of treatment for Mexico, and I think Canada should have the same.

By eliminating the convention tax deduction we have told the Mexican people that every time you do something for yourself to make the relationship with your neighbor a little less onerous, your affluent neighbor will do something to keep you from succeeding.

I think it is urgent that with the first tax bill that goes through this year, that this committee—and you, Mr. Chairman—take the lead in reinstating that exemption for at least this continent; for Mexico, the Americas, and Canada.

Now, anyone who goes to Mexico and talks to their leaders about jobs in Mexico and the need to develop jobs, will not talk to very many and will not talk very long—before finding that tourism, as I have mentioned is very important.

Second, they will immediately bring up present American law which permits the border industries, or the twin industries or, as they call them over there, the machia dores. A border industry is a project where you have a plant on the Mexican border that employs Mexican nationals, which builds part of that which is needed for a completed accessory for America and in return the plant receives some type of an exceptional tax treatment.

The Mexican Government assumes that this is a most significant development on their border for employing their own people. I will submit to you that, again, the first time we have a major tax bill, that America, without considering the overall impact on Mexico, will be for doing away with the tax incentive. It will be done in the name of jobs for Americans but that will be extremely foolhardy, because those jobs, if they disappear, will mean that more and more Mexican people in that growing country will come over here looking for jobs. There is no way we can avoid it, at least not until Mexico has some kind of equality of economic development and opportunity.

I would urge that favorable tax treatment for the two-plant concept be continued, and that we immediately reinstate the convention tax treatment for the continent of America.

Now, in my statement I mention some other items, obviously in the area of energy research and development. It is an area where there is a growing opportunity for America to work with the Mexican people. I personally have discussed this at length with their energy director, a gentleman named Juan Ebinschutz, an extremely progressive and thoughtful man.

I do not think, with reference to these kind of relationships that is merely a case of you or I, within a particular legislative area, pushing for increased relationships with Mexico. I think it is time for us to come over the top of all of this and insist that the United States ask Mexico and Canada if whether they are ready to establish a Commission. A Commission that will begin to explore in depth and recommend to all three countries, steps that ought to be taken by the nations as a matter of national policy to abridge many of the problems that we have.

Obviously, they are, to some extent—maybe to a major extent—economic and they are, indeed, difficult. Agriculture is a difficult one.

I do not think, Mr. Chairman, we can continue to allow problems to flare up and have water put on fires by an ad hoc response to the problem. I think we have to begin with some kind of continental commission that at least sets some ground rules. While the big international debates were going on on tariffs and economics, Mexico had a peculiar situation. They did not know whether they wanted to be subject to them or not. But as they looked at GATT their good economic thinkers are wondering why the United States and Canada were not thinking as a team. That is a very good question.

Whether Europe has a common market or not, they look at their problems as a unit in dealing with the rest of the world. It seems that we could at least begin to do the same. We dealt with GATT as America. Mexico dealt with it as Mexico. Canada dealt with it as Canada.

It seems that that is behind us, but the next time we get together, there ought to be a more cohesive concern that represents the concern of the continent. That will not happen unless somebody like you and this committee and the Congress urges the creation of some mechanism to look at the possibility of a commission. It—the commission—should be comprised of influential people that can think beyond the little, parochial interests that seem to always be at the forefront of these kinds of problems.

So I commend you for this. I hope I can be of assistance. I hope you, too, will take an opportunity to talk to the Mexcian people and their economic leaders about the problems as they see them. It is important that we feel their problems, as well as our concerns.

Thank you very much.

Senator BAUCUS. Thank you very much, Senator.

I wonder, Senator van Roggen, if you could comment on the convention tax problem from the Canadian viewpoint?

Senator VAN ROGGEN. I just made a note while the Senator was speaking, that this, of course, is a problem and it impacts on Canada the same as it does in Mexico—more so, for this reason. The evidence before my committee was that it was probably costing Canada about $200 million a year at the moment.

You have to keep in mind——

Senator BAUCUS. $200 million in lost conventions?

Senator VAN ROGGEN. Lost conventions.

Of course, Canadians are members of the majority of the organizations that hold conventions between the United States and Canada. They supply their share of the members to these conventions. To come out even, we need every 10th convention to be in Canada.

In our case, it is a net loss of that amount of money and while we continue to have Canadians attending these conventions, which are not any longer held in a proportional amount in our country.

Senator BAUCUS. This, unfortunately, gets caught up in a linkage with the Canadian treatment of the tax deductibility of ads in U.S. magazines and TV stations.

Senator VAN ROGGEN. Mr. Chairman, you have heard me expound on that at great length in Canada-United States parliamentary meetings. Maybe I should not repeat that speech here today.There is no question that that linkage has occurred. I can only repeat what I have said to you, and others, so many times before, to make the plea that a provision we made in Canada—not everybody agrees with it—whether you agree with it or not, it was made for cultural reasons.

In other words, the Canadian concern with the slopover, if you like of so much American TV, a large part of our population being 100 miles from the boundaries, as you know, that we have to foster Canadian radio, television, and media at home in order to have any of our own at all. It is not that we exclude yours, because on our cable systems, we have your three networks, as well as PBS.

And so, the tax measure was not basically for revenue. The revenue involved was only about $10 million a year. It was to try to foster as much development in the Canadian television system as possible.

That is hardly, I submit, a proper subject matter to link with convention taxes. The only way the linkage occurred was that they both happened to be in tax bills.

I submit you can put almost anything in a tax bill. These are not related matters, and should not be linked.

Senator BAUCUS. I hope we can move to not reinstate the tax deductibility entirely. As Senator Domenici probably knows, the Finance subcommittee has been holding hearings on this very subject. Senator Byrd's subcommittee, even though it has taken no action yet, it has been a subject that has been the subject of a hearing, so I think we will be able to move on it.

Senator DOMENICI. Mr. Chairman, I merely make the point that, we wonder why neighbors get angry at us and why they have a difficult time understanding us. What I am saying, is that they have a national commitment of literally millions of dollars to build tourist facilities so their people can be employed. In making that commitment they thought they were helping alleviate the border problems. Then we come along—and delete the tax deductions for conventions held in other countries. We did not change the basic law. The tax deduction remains.

We just said if we are going to do this you must do it in America. You cannot go across the border into Mexico and have the exact same convention that you would have in El Paso, Tex.

Senator BAUCUS. One of the basic underlying questions here is the degree to which we in the United States push for better bilateral cooperation in a more unified, comprehensive, bilateral policy with respect to Mexico and with respect to Canada on the one hand, and the other the degree to which we try to group the three countries together.

I take it, Senator Domenici, you think we should push much more in the latter direction, that is a more comprehensive overall policy. That is why you recommended a commission to delve into and formulate some comprehensive overhaul specific recommendations so that we can proceed much more fully so the right hand knows what the left hand is doing.

I wonder whether Senator van Roggen agrees with that.

Do you think it is best to push bilaterally or better to try to find some overall plan?

Senator VAN ROGGEN. I personally favor the bilateral approach—bilateral on both sides. Not in any lack of interest encountered in the best possible relations with Mexico; not without keeping in mind that some Canadians favor a three-way approach because they see their minority position, let me put it that way, as a balance if Mexico were included in the mix.

My concern would be that the Canadian economy might be described as being somewhat more mature in the manufacturing sector than the Mexican economy.

Senator BAUCUS. Could you speak up a little, please?

Senator VAN ROGGEN. I say my concern is I believe the Canadian economy is more mature than the Mexican economy. Our standard of living is close to yours, unlike the Mexican standard of living, that the problems that you have to address with Mexico are different than the problems you have to address with Canada, or that we have to address with you. To try to solve these problems on a three-way basis might make them more difficult rather than less difficult to resolve.

My personal view——

Senator BAUCUS. Could you give an example of that?

Senator VAN ROGGEN. The best example I could give you is what I just said, that the Canadian industrial economy is much more mature than the Mexican industrial economy. Our manufacturing sector is more mature. Our standard of living is very close to yours. I do not know the average standard of living per capita in Mexico at the moment. I am sure it must be very much lower.

So there are different problems to be addressed on the two sides.

We have the problem of wanting to become part, in a sense, of a trading block the size of our competitors. I do not know if that would suit the development of the manufacturing sector in Mexico at this particular time. I would have to leave that judgment to the Mexicans.

Senator BAUCUS. What relations does Canada have with Mexico? What kinds of agreements? What kind of trade arrangements does Canada have directly with Mexico?

Senator VAN ROGGEN. Apart from maintaining a good relationship with Mexico I cannot, offhand—I am certainy not a student in this area—cannot think of any particular outstanding special relationships we have with Mexico that we do not have with other friendly countries.

Our trade with them—I could not give you the figures. I do not have them—could be—well, it would be a part of that 12 percent I referred to in our opening statement. What is left with the whole of the rest of the world after we deal with Europe, the United States and Japan, our trade is small. We have tourism with Mexico—nothing like our tourism with the United States.

Coming back to that, I might add, regarding your convention tax, you have a favorable balance of trade with us in tourism of $1 billion a year.

Senator DOMENICI. Mr. Chairman I just want to clarify my position, then if you would excuse me. I have a hearing in energy that I am late for now.

While I think it ought to be that we ought to be considering some kind of capability to assess the interdependence and come up with suggestions for the entire continent, I am quick to say that we have some problems with Mexico that are far different from Canada's both in dimension and degree and urgency.

For instance, we do not have the problem of undocumented aliens with Canada that we do with Mexico and it is enormous and historic, and we must address that kind of problem.

On the other hand, the more you see the development of energy and what is happening globally, you see a growing relationship between Mexico, Canada and America in terms of crude oil and natural gas and perhaps a trade of coal for the development of nuclear by one to assist the others.

That may be the economic basis for getting together rather quicker than we might otherwise get our heads together.

But I submit that the Mexican people and their leaders are very suspicious, and rightly so if you try to build that relationship around energy in total when they know there are so many other problems.

Senator BAUCUS. I think that is right. There are all these similarities. Both Canada and Mexico want greater access to U.S. technology. We have already talked about tourism. They both would like more American tourists in each of the two countries, so there are overall similarities in addition to the differences.

Senator DOMENICI. Thank you very much.

Senator BAUCUS. Thank you very much, Senator.

Senator van Roggen, unfortunately Senator Domenici has to leave now. I was going to ask him about the Quadrapartite Commission and the United States-Mexico Mix Commission, how those are working out.

Do you have any advice as to how the United States and Canada can set up or utilize the present arrangements better?

Mexico has—there is a Quadrapartite Commission. As you know, the United States has, with Mexico, as well as the United States-Mexico Mix Commission and so forth. On our side, with Canada we have the boundary commission, IJC, and so forth.

I am wondering whether, in your interest in developing closer bilateral relationships, you recommend additional commissions? What seems to make sense here?

Senator VAN ROGGEN. I think, Mr. Chairman, in general terms, the very extensive relationship between Canada and the United States is being managed quite well.

To put that in some perspective, I think that it is important to keep in mind that you cannot have a relationship as huge as that between Canada and the United States without having problems. As you solve one problem, another problem is going to occur.

I suppose the only way that you could have no problems is a relationship such as either one of our countries have with Albania. If there is not much relationship, you do not have any problems.

Our relationship with the United States in trade and in tourism and exchanges of every single criteria you can mention is, by far, the largest of any bilateral exchange on the face of the Earth. There is no other relationship between two countries as you just said, as large as between Canada and the United States.

When you keep that in mind, I submit that the mechanisms at the moment are really working quite well. The IJC is one outstanding example.

This does not mean that there is not always room for improvement.

Where I think we are going to have to make a very fundamental move in the not-too-distant future is in this area of trade, because the GATT has just concluded. It will come into effect between now and 1988 and bring tariffs down to levels that are sufficiently low that the nontariff barriers and the legal mechanisms for protecting our economic societies are going to become the important factors rather than just the tariff.

I am satisfied, and other people who have studied it in Canada, are satisfied that we are going to now, having concluded these multilateral negotiations are going to have to come to a bilateral harmonization of our North American situation, the same as the Europeans are doing in Europe.

Some people are concerned that the legal mechanisms left to the Europeans are such that we have not had a real liberalization of trade as much as a rationalization of it in the Tokyo Round and if that is true then we are going to have to look to cooperation between our two countries in the North American context the same as they have already set up in Europe in spades in the European context.

Of course, we all know of Japan's ability to look after itself in the nontariff barrier area, in spite of being a signatory of GATT.

Senator BAUCUS. I take it from what you say this morning that the Canadian view is very much against the terms "Common Market," "continentalism," et cetera, as those terms are generally used?

Senator VAN ROGGEN. Mr. Chairman, in my opening statement I went to some trouble to outline the main features of a common market. You can see that they are very closely linked politically.

Canadians want to maintain their sovereignty. They would be afraid of political associations with the United States, that they would be swallowed up.

Senator BAUCUS. Why are the Canadians so upset with the phrase "Common Market"? That was my next question.

You say probably the Canadian people are much more interested in the concept of freer trade. I take it perhaps on a sector basis, whether it is petrochemicals or electronics or agricultural machinery, that those are areas where trade can be freer, that tariff and nontariff barriers can be worked with.

Senator VAN ROGGEN. There are a number of areas that can be worked with.

Senator BAUCUS. Would you expand those? Which ones do you feel are the most promising from the Canadian viewpoint?

Senator VAN ROGGEN. We already have the auto pact, which everyone is familiar with. Under GATT, we will have free trade in aerospace. Chemicals need looking at, nonferrous metals.

Senator Domenici, a minute ago, mentioned the fact that at the GATT some of his Mexican friends have wondered why Canada and the United States did not act as a team.

There were instances in nonferrous metals where the United States did go along with Canadian proposals that these things be treated on a sectoral basis. We could upgrade our resources before the tariff impact.

The Europeans just were not interested. As they were not, it fell off the table. Those were things where there was not a joint position, but where the United States supported the Canadian position but it was not important enough to the United States to face down the Europeans on it, so it was set aside.

That is a thing we could come back to on a bilateral basis where we could not get anywhere with it on a multilateral basis and one of the things that we must now address is where are the best areas. Having completed our study as to what we should do, mainly in the recommendation of our committee to go to free trade, we have to have further studies to decide how you would mechanically do it if you went about it step by step.

Senator BAUCUS. What are some of the areas where you think, with freer trade, both economies could prosper more. Petrochemicals is one, is that right? What are some specific areas?

Senator VAN ROGGEN. I mentioned auto, aerospace, petrochemicals, nonferrous metals. I think resource sectors generally, forestry, areas of that sort where your tariffs—you have no tariffs, of course, on resources. Very few countries do. As soon as any degree of value added comes to those resources, tariffs start to come out.

Senator BAUCUS. With respect to petrochemicals, there is a tariff barrier. Petrochemical products from Canada into the United States. You are suggesting perhaps that could be lowered?

Senator VAN ROGGEN. Yes.

Senator BAUCUS. What benefit is the United States getting? Obviously American firms are going to wonder.

Senator VAN ROGGEN. Yes. That trite saying, I am glad you asked that question. I was speaking on that subject to the Canada-United States Committee on the American Chamber of Commerce and the Canadian Chamber of Commerce in Phoenix, Ariz. 6 months ago. One of the members there on the American side asked me that question. He said, you seem to be saying this will sort out

the Canadian manufacturing sector; what will this do for the United States.

Let me answer that in two parts. First, there was a gentleman there from the State Department. He was kind enough to address himself to that question and he did it very well, I thought very thoughtfully, in saying that, basically speaking, it is in the self-interest of the United States to see a healthy and strong Canadian economy sharing this economy with it, in view of the world situation.

Now, the other point I put to you is based on the figures I gave you a few minutes ago of the $5 billion imbalance of payments with the United States right now, an unfavorable balance of trade and manufactured goods of $12 billion, the majority of which is with the United States.

These figures, if you put them in a Canadian context of 23 million people are so huge that, if we do not find the solution in rationalizing our manufacturing sector in a North American context we are going to find some other solutions. I am afraid they are going to be much less satisfactory for both of our countries, namely restrictive measures that will not be good for the Canadian economy but would be essential if we were to redress in some manner these huge outflows that we have now in our balance of payments which we cannot support indefinitely.

You then come, of course—if you would like me to go into it, I would—the whole question of linkage, whether in negotiating this type thing you should get into energy or oil or natural gas. I would submit that that type of linkage is not really the way it should be approached. We are exporting, as you know, to the United States at the moment substantial quantities of energy in various forms, particularly gas and will continue to do so.

I think these things are best negotiated on their own. They are areas where tariffs do not presently apply.

I think when you have a relationship as huge as the United States and Canada, if you start linkage, you get down into a tunnel you can never find the end of, because you link manufacturing tariffs with energy and you link that with 200 mile coastal boundaries, you link that with fisheries, you link that with agricultural problems, you never come to the end. It becomes such a tangled web that you never come out at the other end of it.

I would plead, as I do always, that we follow the tradition of our two countries of not having linkage, but deal with each matter on its own merits, which I think we have done well in the past and should continue to do in the future.

Senator BAUCUS. Still, there is some relationship among all of these subjects.

Is it true, or not true, that the more the United States is accommodating and reasonable in reducing these barriers with respect to Canadian products, then perhaps then Canada might be more willing to sell surplus natural gas to us at a reasonable price?

Senator VAN ROGGEN. Let me put this to you. Why would not Canada sell natural gas to the United States if it has natural gas surplus to its needs? It has always done so and welcomes the foreign exchange that that brings.

I do not think any country in the world, Canada included, any sovereign country, is going to say look, we are going to increase, even though we do not have enough for our purposes at home, that we are going to send you gas whether we have it or not.

For the record, Canada, in the area of oil, is a net importer of oil. It does not have surplus oil. We import 30 percent of our oil at the moment at OPEC prices from the rest of the world, OPEC countries.

We do have a surplus of gas and we are presently exporting large quantities of gas to the United States.

The only argument I think we can get into is whether or not our National Energy Board's assessment of what our excess reserves are would completely jibe with your assessments. We do not always agree within the country.

The Alberta Energy Board says that the reserves are more than the National Energy Board says. These are, I submit, minor variations when you look at it in the long term, and in the long term, we have always been perfectly prepared, and the evidence is there, the record speaks for itself, to export resources to the United States.

There have been no impediments put on the export of resources to the United States with the sole exception of oil and gas, as a result of the energy crunch.

As I pointed out, we can hardly export oil to you when we are importing it and we are maintaining our gas exports and the National Energy Board of Canada has come down with a review of our reserves and will be ruling on existing applications for additional exports to the United States.

I would think that ruling will be done in a few weeks, or we are almost waiting daily for it.

Senator BAUCUS. What you are saying is that the great determinant as is whether Canada exports more gas to the United States, whether it has sufficient reserves, not what we do on trade barriers or petrochemicals, et cetera?

Senator VAN ROGGEN. We cannot start fueling our homes by chopping wood and give you all our gas if we do not have enough at home. If we have enough at home for our own needs, we have always been, and see no reason why we would not be in the future, of being in the business of earning an honest buck by selling it.

Certainly with our balance-of-payments situation, we desperately need to do that.

Let me give you the figure. Last year, Canada was a net exporter of energy to the tune of $2 billion. Most of that was to the United States. Some of it was sold to Japan. Net exporter of energy of $2 billion. This year, we will probably be a net exporter in the area of $3 billion.

Senator BAUCUS. Still there is probably some discussion in Canada, what it would do with its natural gas. It could either sell more of it to the United States, or encourage more conversion within Canada to natural gas, use the natural gas more for the manufacture of petrochemicals. There must be some discretion in Canada on what to do with natural gas.

I do not want to dwell on this subject. It seems to me that there are areas where the United States and Canada can work together

to our mutual interests rather than just saying, well, we are just two independent countries. We do not care what you do. We want your gas.

Senator VAN ROGGEN. Yes.

I said in my statement that while the Canadians reject the idea of pooling energy for the obvious reasoning if we pool ours with yours you would use up the pool 10 times as quickly as we would because of our population. That obviously is not something the Canadians are prepared to do.

As far as cooperation is concerned, we have cooperated in the past and I would hope we would cooperate more in the future because I think this continent has to look at the rest of the world the way it is shaping up into blocs, trading and otherwise, and recognize the fact that we are living on one continent and sharing on one continent.

I for one, repeat the remark of a politician who was a friend of mine years ago. I cannot think of any nation I would rather share the North American Continent with than the United States.

Senator BAUCUS. Where do we begin the process of negotiations, sector agreements, more than we have in the past? I must confess I am not familiar with how the auto pact was developed, even if that is a good model. I wonder if any agencies in the U.S. Government can be helpful here in initiating greater sectoral cooperation or leaving it entirely to industry?

I am curious on how we get the ball rolling here in some positive way.

Senator VAN ROGGEN. I think that once the will to do these things has arrived that the mechanisms will be found quickly enough. I think the problem that we are having in Canada, we are undergoing this debate as to whether or not we can maintain our independence and our sovereignity if we go further into a relationship with the United States, such as the free trade relationship.

One of the reasons I so welcome the opportunity of coming here today is that the talk recently of a North American common market in energy, things of this sort, was having an adverse impact on Canada from what people like myself are trying to do—namely, further free trade because people, when they muddle up the two terms, say we cannot have free trade, they are just after our energy and that has a counterproductive effect on the thing that my committee and myself are trying to do.

So I welcome this opportunity to try to separate the two things.

On energy, I think that we should face the fact in North America, Canada, and the United States—I know you have a much larger problem in oil than we do, but we are both showing every appearance of having very, very large reserves of gas on both sides of the boundary.

As a layman, I would suggest you have a great deal of gas yet to find in the United States. We are both rich in coal, we are both rich in uranium ore, we are both rich in hydro. I think, subject to the expense of making the adjustments that OPEC is forcing upon us that we will be in a satisfactory situation in energy, apart from the oil problem—and we have that problem the same as you and we do not have a pool of oil out there that we are sitting on, as I think some Americans sometimes feel that we have.

Senator BAUCUS. Do you mean you do not?

Senator VAN ROGGEN. No. Why would we be sitting on a lot of oil and importing 30 percent of our requirements at some $20-odd a barrel?

We have been drilling on our frontiers at great expense; on the Arctic islands offshore, we found a lot of gas immediately, but no oil. The first find was only a few weeks ago.

Senator BAUCUS. I know that. I do think it is an American myth that Canada has immense pools.

Senator VAN ROGGEN. There is no question. An awful lot of Americans say, those Canadians are sitting up there with all of that oil and gas and they will not let us have any—it is not correct.

Senator BAUCUS. Well, Senator, I very much appreciate this conversation. Unfortunately, we have more witnesses. In the interests of time, we will have to proceed.

[The prepared statement of Senator Van Roggen follows:]

SPEAKING NOTES OF THE HONORABLE GEORGE C. VAN ROGGEN ON "WHAT FREE TRADE IS NOT!"

The Senate Foreign Affairs Committee, on which I have the honour to be chairman, last August published the results of its study of Canada-U.S. Trade. You may be aware that our principal recommendation at the conclusion of the report reads as follows: "The committee urges governments in Canada, as well as the business and labour communities, to assess without prejudice Canada's present economic prospects, the alternative solutions and their consequences. The committee recommends that they consider seriously the option of bilateral free trade with the United States."

While I hardly need explain the importance of Canada's trade to an audience such as this, it is important for every Canadian to be fully conscious of the fact that the standard of living to which we, as a nation, are accustomed depends completely upon our continuing to be one of the great trading countries of the world. Without it there is no way that a small population of just over 20 million, 95 percent of whom are stretched in a narrow band of some 200 miles in width by 5,000 miles in length, could operate anything resembling a modern industrial economy.

Let us refresh our memories if only briefly on the effects of Canada's trade.

Canada's exports approach 25 percent of our gross national product (equal to exceeded, of course, by our imports) and of this immense trade 70 percent is with the United States; over 11 percent with Europe; over 6 percent with Japan; leaving less than 13 percent for all the rest of the world combined, even if you include our massive grain sales to Russia and China.

I am not suggesting you ignore export opportunities to Third World countries, but the vast majority of our trade will continue to be with the United States and the rest of the industrialized western world.

What does this industrialized world conssist of?

The United States with over 225 million people and the largest domestic market on the face of the earth, coupled with first-class resources and technology—truly a trading block of its own.

A Europe consisting of over 300 million highly-skilled people, the majority of whom are united in 9 nations of the common market and the remainder of whom live in countries which almost without exception, have entered into free trade agreements with that common market, together constitute the world's largest trading block.

Japan, 100 million in the home market with an imperative—I repeat not a choice but an imperative—(because of almost total lack of resources or food or energy at home)—of remaining totally competitive and thus providing for its production runs a total market both at home and abroad equivalent to that of United States or Europe.

Then add into the equation the "New Japans" of South Korea, Taiwan, Hong Kong, Singapore—and there will be others to come—pouring out an endless volume of items which only ten or fifteen years ago might have been considered high technology but which today are basically low technology, with labour costs with which we cannot possibly compete if we are to maintain our standard of living.

Now couple this general picture with the over-all reduction of tariff protection that occurred in the Kennedy round and then place on top of that the further

reductions at the recently completed Tokyo round of the GATT and you have Canada as odd man out in the worst of both possible worlds—with a small domestic market and with tariffs too low to be really effective.

Let there be no mistake I am bullish on Canada but the time has come when we can no longer afford the luxury of relying on our great natural wealth as a substitute for hard economic thinking and when we must stop trying to make one of everything and instead concentrate on our areas of natural advantage.

I recently read the following in an article on this subject—unfortunately I cannot remember the author who was a foreigner, but I would submit a perceptive one: "Canada's industrial aim would appear to be to try and make and do everything that everyone else makes or does, regardless of economic logic or good business sense. It is time that Canada quit the realm of fantasy and grappled with reality as represented by the real world around her. In the cold unsentimental place of struggle for competitive advancement, the beginning of wisdom for each nation is to decide what can be done well and profitably and what should be abandoned. A study of the nations which have been most successful in the international marketplace indicates that an effective industrial strategy begins with the realization that no one country can make everything more cheaply and more effectively than others, that specialization and constant innovation are essential and that the selected areas of specialization must be accorded the full support of coordinated national policies and the countries human and natural resources."

Let me attempt a very brief overview of Canada's situation today using rounded figures:

A large resource sector in forestry, minerals, energy and agriculture in which we have a favourable balance of trade in excess of $10 billions.

A manufacturing sector developed, in large measure in response to our tariff policy to serve the small Canadian market only in which we have an unfavourable balance of trade in excess of $10 billion.

A chronic imbalance of payments in invisibles of approximately $5 billion a year.

A concern with foreign ownership and control which we cannot begin to address until we halt our imbalance of payments (estimated at about $7 billion this year including trade and invisibles) and stop borrowing the savings of foreigners (or selling off the "back forty") to cover the same.

So what do we do?

First, deescalate our expectations and government take to 10 percent below the United States average as opposed to 10 percent above.

You may ask why we should live at a level 10 percent lower than the Americans and I can say, well we had better or the international market place will see that we do as is happening right now. But more seriously, it is important that we realize that it costs money for 23 million Canadians to occupy this vast geographic area we call Canada with its difficult climate and great distances. It simply costs Canadians more money to maintain their highways and railways and communications systems, heat their homes and generally run their country than is the case with 225 million Americans in a more compact area with, on average, a better climate. Whether it should be 10 percent or 15 percent I will not argue with you but those figures are historic and we are in some of our present difficulty because we gained the idea that we could live 10 percent higher on the hog than the Americans.

Second, concurrently seek to negotiate a free trade agreement with the United States so as to draw even with them in due course.

### WHY FREE TRADE?

One way I use to assess the pros and cons of Canada-United States free trade is to put the advantages and disadvantages on an imaginary scale.

On the disadvantage side we place:

First, the loss of our tariff protection—but not the relatively higher protection of the past, particularly before the Kennedy round but the comparatively low protective levels that now prevail following the Tokyo round.

Second, the period of dislocation and adjustment, but this hardly belongs on the scale because we will face this whatever we do.

And, on the other side of the scale:

First, Canada gets free access to the huge United States market and becomes part of what I would consider the world's best block—my friend Jake Warren argues for multilateral trade concessions and I agree—but our competitors all have a large home base market from which to compete with us. We need the same advantage as they have. Canada-United States free trade is not just access to the United States market. It is the creation of a large base from which to develop world scale plants, which scales will enable us in due course not only to be competitive in exports to

the United States but to the other blocks themselves, the Third World and in that very important area of home market import substitution.

Second, it would result in our slowly rationalizing our branch plant economy where we try to make one of everything with its attendant problems of foreign ownership, foreign control and lack of Canadian R and D.

Third, Canada-United States free trade would enable us to improve the level of processing or "down streaming" our resource industries which receive and need almost no protection from the Canadian tariff but are inhibited from further processing in Canada by the United States tariff.

Fourth, as tariffs have gone down in recent years and will again during the next 8 years, non tariff barriers (NTB's) have not only increased but have assumed ever increasing relative importance—NTB's are difficult if not impossible to police effectively on a multilateral basis and only a free trade agreement with the United States would give us a proper handle on these in our largest market (i.e. 70 percent of our trade now). This may well be the most important single argument in favor of what we propose.

Fifth, basically in a bilateral free trade situation the exchange rate would replace the tariff and become the moderator. This has a great advantage as a lower Canadian dollar (say 90 cents United States average), has a double benefit of inhibiting imports and helping exports whereas a tariff only provides one of these benefits.

Sixth, in order to succeed we would be required to discipline ourselves by adopting measures (such as tax incentives and stopping the government printing presses) to increase capital formation by Canadians which would have the dual advantage of not maintaining the Canadian dollar at artificially high levels by too much borrowing (as in the mid-1970's) and reduce our imbalance in invisibles (and incidentally help redress our foreign ownership problem).

Seventh, we could revise our competition policy so that we would no longer import and imitate United States anti-trust policy designed for a market of 225 million people. Free trade would protect our consumers so we could leave the trust busting to the United States and do a little trust building in Canada. To put that remark in perspective, I point out that the most avid trust busters in the United States suggest a maximum 15 percent control of the market in a given item as optimal. I need only point out that 15 percent of the United States market equals 150 percent of the total Canadian market to point out how inappropriate United States competition policy is applied to the Canadian scene.

Eighth, the removal of tariffs on imported goods would reduce Canadian costs of living and thus increase our productivity and competitiveness.

I would submit that if we look at our imaginary scale, the advantages of Canada-United States free trade considerably outweigh the disadvantages.

As a result of the Economic Council of Canada report, the Senate committee report, the C. D. Howe Research Institute position, the statement of our new Minister of Finance, Mr. Crosbie and the positions of a number of individuals knowledgeable in the field, all supporting Canada-United States free trade, or at least a study of it, the subject has come to the fore and instead of being a complete no-no as was the case ten years ago, one is now permitted to discuss it in front of the ladies.

Unfortunately, these developments have been coupled with a good deal of ill informed rhetoric by many who should know better, criticizing free trade proposals for what they are not rather than for what they are:

A Canada-United States free trade agreement—

Is not a North American common market.

Is not a Canada-United States Common Market.

Is not a proposal for a sharing of natural resources.

Is not a proposal for the pooling of energy supplies.

Is not a proposal for political integration.

Is not a form of "Continentalism" if that word is used in its pejorative sense rather than in the context of mutual cooperation.

Proposals for a Canada-United States free trade agreement are simply aimed at strengthening the Canadian manufacturing sector by rationalizing it over a period of time in the context of today's situation where it has lost its traditional high tariff protection, and as I have said earlier is facing the worst of both possible worlds.

A common Market or customs union as represented by the European community under the treaty of Rome involves free movement of goods, labour and capital between the member states who agree at the same time to be bound by a common external tariff against the rest of world and who agree to the harmonization of non tariff barriers and a host of other matters not only as between themselves but in their relations with the outside world. In addition, the treaty of Rome specifically

contemplates a degree of political cooperation (as evidenced by the recent direct elections to the European community parliament) even if not full political union. The hesitancy of some nations to join the European community as was the case with Great Britain is that in so doing they indeed give up a real degree of national sovereignty.

None of the free trade agreements entered into between Finland, Sweden, Norway, Austria, Switzerland, Portugal etc., with the European community have any of these characteristics and neither would such an agreement between Canada and the United States. To comply with the GATT, it would simply be an agreement removing the remaining tariffs between the two countries on "substantially" all of the trade (we are already at a quite substantially high level) over a "reasonable" length of time (typically ten years) in a given "sector" (in this case, manufacturing). Such an agreement would provide a policing mechanism for non tariff barriers as between the two countries but would have no bearing on external tariffs or on tariff barriers that either country might wish to employ relative to the outside world. By way of example, Canadian quotas against Hong Kong textiles would not be affected. Our textile industry would only be expected to compete in the higher cost Canada-United States market to all of which it would also have access.

Such a free trade agreement would have no bearing on our mineral or other resources which we could export or not as we chose. Such resources as you know, are generally not subject to tariffs anyway save when they are upgraded and free trade would encourage and enhance the possibility of such upgrading by giving the upgraded resources free access to the United States market.

Oil, natural gas, electricity etc. are not the subject of tariffs and would continue to be subject to exactly the same regulatory authorities and permits as they are today.

If we followed the European examples, agriculture (including fisheries) would not be included in such an agreement even where tariffs are concerned (and such an exclusion is permitted under the GATT).

I for one and I know most Canadians wish to continue a mutually satisfactory cooperation in all these other areas but this should not be muddled into a discussion of bilateral free trade in manufactured goods.

As we point out at page 122 of our report, when the European communities were first formed, the United Kingdom, Sweden, Norway and Denmark, Iceland, Portugal and Switzerland and subsequently Austria and Finland formed a free trade area (EFTA) which involved free trade in industrial goods but none of the other characteristics of a common market or customs union. When the United Kingdom and some of the other members of EFTA started to join the European community, EFTA was effectively terminated whereupon all of the remaining small countries of Europe such as Switzerland (6 million), Portugal (9 million), Sweden (7 million), Austria (7 million), Finland (4.5 million), and Norway (3.7 million) all decided to negotiate industrial free trade agreements with the European community of 225 million souls. In every instance a disproportion substantially greater than Canada's population relationship in the United States.

We go on to point out in the report that Finland's case was particularly interesting, and I might say that the following example was given to me by the Finnish Ambassador to the European community, who negotiated Finland's free trade agreement with the community. During its association with EFTA, Finland monitored its exports of industrial goods and found that such exports expanded more rapidly with the United Kingdom under free trade, even though the U.K. then had a sluggish economy, than with Germany whose economy was booming, and which had traditionally been Finland's closest trading partner, but to which Finland did not have free access. It was this experience that persuaded Finland to enter into the free trade agreement with the community. (The experience of Southern Ireland (Eire) which has had free trade with Great Britain for many years is equally persuasive.)

Let us therefore enter upon this debate with an open mind including a consideration of the following points:

1. Will Canada or need Canada bite the bullet? I have already pointed out that as a country rich in resources we have been able to maintain a high standard of living with a minimum of hard economic discipline in our thinking. I feel, however, that if we are to move competitively to the specialized world of the future we must rationalize our manufacturing sector so that it becomes world scale and world competitive along with our agricultural fisheries and other resource sectors, and Canada-United States free trade is one of the ways this can be done.

2. Canada's constitutional problems today are primarily concerned with Quebec separatism but there is also a problem, not of western separatism, but of western alienation. Of course I am not advocating civil war but I would point out to you that one of the principal causes of the alienation of the South prior to the American

Civil War was not the slavery but the northern imposition of a tariff structure on the South which required the South to sell its cotton and agricultural products at cheap world prices and buy its manufactured goods at higher than world prices from the northern States. Free trade would go a long way to resolving western (and for that matter Atlantic provinces) alienation.

3. I respect the real and legitimate concern of many businessmen in the manufacturing sector that plants will just move south or at least not be built again in Canada under free trade. You would be surprised how many have said to me, "it wouldn't be good for Canada. However, it would be O.K. in my particular business." I feel it terribly important that we heed the warning of the financial post which headlined an article, "Pssst—We're Backing, Eyes Shut, Into Closer Trade Ties With the U.S." As the present round of the GATT will bring us to 80 percent free trade with the United States with a further 10 percent probably protected by tariffs averaging as little as 5 percent, we may be moving so close to free trade that we will have its disadvantages without its advantages and it would be much better to accomplish it with our eyes open, making the necessary plans and transitional arrangements in an organized fashion rather than simply muddling through.

4. It is important to keep in mind that the European community was an invention of innovative and imaginative people breaking new ground. We also could be innovative—even across the board free trade would be phased in over a ten year period but I believe we could stay properly within article 24 of the GATT by proceeding with the United States on a sector-by-sector basis or industry-by-industry, if you like (automobiles, aerospace, farm machinery). Our difference in size and common language make Canada and the United States a unique combination in the world and possibly we require some unique mechanisms, but I am convinced that they must be within the general context of gaining access to the larger Canada-United States market for our manufactured goods if we are to develop our potential.

Senator BAUCUS. Senator Chafee was going to be here this morning but was called away. He is out of town. He has a statement that he would like to submit.

[The statement of Senator Chafee follows:]

STATEMENT BY SENATOR JOHN H. CHAFEE

The United States has long shared common interests with Canada and Mexico. All three North American countries have rich interwoven histories of discovery, and development. While differences have marked the rate and direction of each country's growth, the basic beliefs of all three societies are similar.

Today, Canada, Mexico, and the United States face similar challenges. Inflation, unemployment, energy development and conservation, reciprocal fair trade, and environmental protection problems present the North American nations with difficult policy decisions. Yet, at the same time, such challenges present a unique opportunity for the three countries to pursue common self-interests, to coordinate policies, and to pool their respective strengths.

The Finance Subcommittee on International Trade hearings on the subject of North American economic interdependence represent the first steps on the part of Congress to study trilateral cooperation. The self-awareness of the institutions and resources characteristic of Canada, Mexico, and the United States has often hindered the kind of collective effort that could lead to a new international economic and political strength for North America. Furthermore, a preliminary study on North American trilateral cooperation prepared by the Dean Rusk Center at the University of Georgia, points to the importance of greater mutual understanding between the three countries. The report states: Our citizens and insensitivity to the problems, attitudes, and institutions of each nation have allowed each government to defer pursuit of the obvious benefits of mutual actions.

A mutual understanding and appreciation of each society's people, and of the goals, hopes, and expectations of its people, must occur before consideration of how a cooperative effort may be able to meet each society's needs. In this way, we will begin to identify the truly promising areas of a trilateral agreement, and avoid the unrealistic. It is the purpose of these hearings to explore the potential benefits and difficulties of greater North American interdependence.

During the Senate's August recess, I had the opportunity to participate in meetings of the Canada-United States Inter-Parliamentary Group. These meetings provided a forum to discuss those issues of interest to both nations, including trade, defense, investment, energy, fisheries, and environment. I cannot emphasize enough the willingness of the Canadians to seek mutual agreements with American repre-

sentatives during the conference. Furthermore, it was astounding to realize just how much our two countries have in common, and how interdependent we are right now.

The statistics on North American interdependence are, in fact, most significant. Canada, Mexico, and the United States have established successful relationships in many areas due to historical ties, governmental agreements on an ad hoc or issue-by-issue basis, or private enterprise. Some current example of interdependence, that may be expanded are:

(1) Trade; Two-way trade between the U.S. and Canada has risen from $39 billion in 1974 to over $63 billion last year. The growth of U.S.-Mexican trade is also impressive, having increased from $6.4 billion in 1974 to almost $13 billion at present. Export opportunities for Canada and the United States have greatly expanded as a result of Mexico's own rapid economic growth.

(2) Energy; U.S. net crude oil imports from Canada are currently running at 155,000 barrels per day. (This is well below the high of one million barrels per day reached in 1974.) The U.S. also imports almost three billion cubic feet per day of natural gas from Canada, or about 5 percent of U.S. consumption. Energy trade with Mexico is less extensive than with Canada, but is growing steadily. 400,000 barrels of Mexican crude oil are imported into the U.S. This represents about 80 percent of Mexican exports. In addition to oil and gas, the potential for increased electricity exchanges is great. For example, the U.S. currently provides Mexico with 70,000 megawatt hours annually. The U.S. imports over 17.5 million megawatt hours each year from Canada.

(3) Investment; In 1977, the U.S. investment in Canada amounted to more than $35 billion, or one quarter of total U.S. direct investment abroad. Canadian investment in the United States has risen to $6 billion in 1977. Likewise, U.S. direct investment in Mexico is sizeable, amounting to over $3 billion.

In many respects, the three leading North American economies are already complementary and interdependent. Trade flows, immigration, transportation links, tourism, financial ties are great and are continuing to increase. There is more opportunity for exchanges and shared projects in agriculture, science and technology, business, and social services.

Any trilateral effort, however, must be preceded by understanding and approached with care. Much is at stake in the negotiations between any group of nations, and there are many delicate issues that challenge the United States' future relations with both Canada and Mexico. Nonetheless, these three nations are aware of their common struggles, and interests. The government institutions and processes are diverse among these countries, but serve common functions of protecting and caring for their citizens.

If we begin by understanding the needs and environments of one another, and today's hearing will contribute to this effort, the potential will exist for building a partnership between the North American nations—a partnership of economic stability, and for a better way of life.

I commend the National Governors' Association, and especially Governor George Busbee, for their important work on the subject of trilateral cooperation and their commitment to this issue.

Senator BAUCUS. Also he asked me to personally tell you how much he misses being here. He particularly enjoyed working with you in the interparliamentary group in Canada this August and he wishes you well and again wishes he could be here.

Senator VAN ROGGEN. I would appreciate it if you would reciprocate those sentiments to Senator Chafee. I enjoyed also his interchanges as well as your own and other members of your congressional delegation there. I hope that we will find ourselves further down the road we are discussing by the time we meet next year.

Thank you very much for inviting me here this morning.

Senator BAUCUS. Thank you very much, Senator. We appreciate it.

Our next panel will be on the subject of scientific and technological cooperation, including Thomas Pickering, Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs; Mr. Harvey Averch, Assistant Director, Directorate for Scientific, Technological and International Affairs, NSF; and Mr.

Princeton Lyman, Acting Director, Institute for Scientific and Technological Cooperation.

I am very happy to have you gentlemen. My suggestion is that each of you, whatever statements you wish to give—and you can submit your statement for the record or read it, whatever, when you are all three finished, we will try to get into a little discussion here.

Whoever wants to proceed first, go ahead.

## STATEMENT OF THOMAS R. PICKERING, ASSISTANT SECRETARY OF STATE FOR OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS, DEPARTMENT OF STATE

Mr. PICKERING. Thank you very much, Mr. Chairman. I will begin with my colleagues following along. I have a statement I would like to submit for the record and would like to cover a few points in a brief summary of the statement.

Senator BAUCUS. Feel free to comment on any of the points that you heard earlier this morning, whether you agree or disagree with anybody, even with me or Senator Domenici. Anybody.

Mr. PICKERING. I am Thomas R. Pickering, Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs. I am delighted to have the opportunity to appear before the subcommittee today to discuss with you a subject that has become increasingly important in United States relations with Mexico and Canada: Our scientific and technological cooperation with our neighbors to the north and south.

Science and technology cooperation has become an important aspect of American relations with many other countries and contributes to the progress of science and technology in this country.

The United States is a partner to a great variety of agreements which call for cooperation in agriculture, oceans, space, environment, energy, national resources, health, defense, housing, transportation, and science and technology in general.

Many government agencies are involved in addition to scientists, engineers and others from private institutions throughout our country. Science and technology agreements serve a variety of objectives involving differing levels of advanced planning and implementation and require constant attention.

The Department of State does not manage specific scientific projects, nor do we attempt to follow the technical details of each individual project. We depend on the participating agencies with technical competence to do this.

The State Department does, however, coordinate our bilateral and multilateral cooperative programs to insure that the general areas of cooperation make sense and that the various programs complement and enhance our foreign policy interests.

The primary responsibility of the Secretary of State for coordination and oversight with respect to all major science and technology agreements and activities is recognized in title V of the Foreign Relations Authorizations Act for fiscal year 1979. The Bureau of Oceans, International, Environmental and Scientific Affairs serves as the Secretary of State's primary agent in carrying out this responsibility.

One point that has been driven home repeatedly in recent years is that we share not only borders with our neighbors to the north and south but common problems as well, common problems which call for common solutions, in many cases. Whether these problems are transboundary in nature or only similar on both sides of our borders, it makes a great deal of sense for the United States to coordinate and carry out cooperative research with its neighbors in areas where our interests are closely intertwined.

When scientists work together and share their data and results, we and our neighbors have the same factual basis on which to approach problems.

While I would not want to suggest that operating from common data will always guarantee agreement on what we may see as the preferred solution, this approach does facilitate compatible decisions and it provides the underpinnings for joint and mutually supportive corrective actions.

For example, many marine species move about in the oceans and cross the boundaries with our neighbors on a regular and cyclical basis. It just does not make sense for the United States to impose strict conservation measures in its zone only to have the results frustrated when species cross a boundary.

In the case of certain fish, we conduct joint research with Canada and Mexico; and we share the data. By developing a common understanding of the fishery in question, we are frequently able to reach agreement on appropriate management and conservation procedures and yields.

The question of how a particular fishery should be shared is a separate issue based mainly in economic and historical and other considerations. The mechanism for scientific ant technological cooperation between the United States and Canada on the one hand, and the United States and Mexico on the other, is a very different one.

In the case of Canada, much of our cooperation occurs in the private sector. When it has proven useful, government-to-government agreements have been worked out on specific problems. However, it has not been necessary to set up a formal structure to coordinate our overall science and technology cooperation.

The role of the Department of State and the various technical agencies of the United States is basically to be alert to new opportunities for cooperation and to facilitate such cooperation whenever it is useful to do so. At present I would characterize United States and Canadian science and technology cooperation as excellent with the formal role of the Governments being minimal.

In the case of Mexico, many of the scientific activities which we in the United States carry out in the private sector here at home are carried out in Mexico in the public sector. It has proved useful to have a broad coordinating mechanism, therefore, we have set up such a mechanism called the Mixed Commission, in order to establish the proper interface between the United States and Mexican research programs.

When Presidents Carter and Lopez-Portillo met in Mexico City in February of this year they agreed to strengthen the mechanisms for scientific and technological cooperation between the two coun-

tries. When they met here over this past weekend, they reported to their publics on the results of that strengthening.

This has given increased impetus to the Mixed Commission which has covered science and technology and has resulted in several expanded initiatives. The Bilateral Meeting on Arid Lands and Agriculture, which took place in Saltillo in Mexico from September 10 to 14 was characterized by our Mexican colleagues as a breakthrough in United States-Mexican scientific cooperation.

In general, I would say that United States-Mexican science and technology cooperation has made significant progress over the past year and that the Mixed Commission has proved to be an effective mechanism.

While we have probably identified the most important areas for cooperation, there may be other areas where increased cooperation might be fruitful. For example, the complex problems associated with the Campeche oilspill indicate that further joint planning and study on oilspills in the Gulf of Mexico and in the Pacific are called for.

As Mexico accelerates its development process in the years ahead, there will undoubtedly be many more opportunities for cooperation. The Mexican scientific and technological base will expand rapidly in the development process, and I would anticipate a broadening and deepening of the S. & T. relationship between our two countries both formallly and informally. It is important on both sides of the border that development and growth not create health and environmental problems for either of us.

My longer statement, Mr. Chairman, includes a summary of the joint science and technology activities undertaken both with Canada and with Mexico and, I believe, speaks for itself. This concludes my summary statement.

If the subcommittee has no objection, as I remarked earlier, I would like to have this detailed description of our science and technology cooperation with the two included in the record.

Senator BAUCUS. Thank you very much.

Mr. PICKERING. Thank you very much.

Senator BAUCUS. Which of you two wishes to go first?

Mr. AVERCH. We will go in the same order as on your witness list, Mr. Chairman.

Senator BAUCUS. All right.

Mr. AVERCH. Mr. Chairman, I would like to enter my full statement into the record and just discuss a few highlights which I think will contribute to the understanding of scientific and technical relations with Mexico in particular.

## STATEMENT OF DR. HARVEY AVERCH, ASSISTANT DIRECTOR, DIRECTORATE FOR SCIENTIFIC, TECHNOLOGICAL AND INTERNATIONAL AFFAIRS, NATIONAL SCIENCE FOUNDATION

Dr. AVERCH. In the context of this hearing, let me suggest that our scientific and technological agreement with Mexico is a form of international trade where each country exercises comparative advantage so that both gain. Since the market for research and for scientific and technical information is not perfect, our Government is especially active in the case of Mexico.

Our S. & T. agreement began in 1972 with the visit of another Mexican President and it has continued to this day. The NSF was designated as the executive agency for the agreement—I believe it is important that we understand what an executive agency does. It plans, coordinates, facilitates, seeks funds for the program and attempts to arrange for the participation of other Federal agencies.

The Mexican agreement is, of course, a government-to-government agreement so it covers other agencies as well as the NSF. We work with, and report to, the Department of State, and, technically speaking, I report to Assistant Secretary Pickering.

In the first few years of the agreement that our resources were very limited. I think it is important that the committee understand that in international S. & T., most agencies are limited both by their organic acts and by available resources. There are very few technical agencies other than the NSF that have a broad charter to do international science and technology. In the competition for resources within an agency, international S. & T. has had less priority historically.

That was true of our Mexican agreement. In NSF we used our own resources and, of course, we had to compete for funds against the domestic research programs of NSF. That competition accounts for the shape of the program over the years.

I would also like to point out an asymmetry in the objectives of the United States and Mexico. Our objective is to create incremental benefits for U.S. science. On the Mexican side, work has to complement Mexican national priorities for economic development. If you will notice, the Mexican S. & T. plan involves many applied projects, 33 percent with respect to industry, 12 percent with respect to nutrition and health. The plan calls for about 2 percent of Mexican S. & T. resources to go to basic research.

The United States has a comparative advantage in doing basic research, and the Mexican side has a comparative advantage in research on specific areas, particularly if there is a unique site and/or unique flora and fauna.

Given the asymmetry in objectives even though we all agree that technical excellence or technical merit were necessary, we still have to negotiate particular projects because of the different objectives. We have worked out specific rules and are now able to rank projects in order of priority.

I will just sketch the type of project for you. There are scientific visits, workshops in either country, and cooperative research projects. The range of projects has gone all the way from basic physics to research in making guayule rubber economically viable. We have worked on prospecting techniques, done modelling migration, which earlier speakers have addressed, done guayule research, worked on jojoba, and on our side, a number of important American scientists have been able to conduct ecological and floristic studies that would not occur without the agreement.

As a result of President Carter's visit to Mexico, our agreement was expanded this year. This expansion led to a meeting of the Mixed Commission, which Assistant Secretary Pickering referred to, on June 7 and 8, in Washington. There, the hands of both the State Department and the executive agency were strengthened. The domestic agencies agreed to improve their reporting proce-

dures on activity with Mexico, and we agreed to exercise much more oversight over the work of the Joint Commission.

Substantive working groups have been set up. These cover: railway research and development, new crops, arid lands and agricultural productivity, energy research, industrial measurement and instrumentation, technical information transfer which, for a developing country is of utmost importance, and then our own work in basic research. Within these working groups, a particular agency has the lead role. For example, DOT has the lead role in railway research.

In our own NSF work for next year, we have put marine science, earth science, earthquake engineering, tropical biology, nutrition, and health research on the agenda and will pursue them in the way that I described.

I believe the broadening of the work of the Mixed Commission will help our relations with Mexico, both scientifically, technically, and economically; the increased oversight procedures and the improved reporting will insure that both sides reach their objectives.

Mr. Chairman, this concludes my summary and I will be happy to answer any questions.

Senator BAUCUS. Thank you very much, Dr. Averch. I think we will wait until Mr. Lyman has spoken, and then ask questions afterward.

Mr. Lyman?

STATEMENT OF PRINCETON LYMAN, ACTING DIRECTOR, INSTITUTE FOR SCIENTIFIC AND TECHOLOGICAL COOPERATION

Mr. LYMAN. Thank you, Senator. My name is Princeton Lyman. I am the director of the Institute for Scientific and Technological Cooperation Planning Office. It is a pleasure to have this opportunity to testify before this subcommittee on the subject of scientific and technological relations between the United States and Mexico and between the United States and Canada.

I have made available to the committee a longer statement which I would ask to have made a part of the record——

Senator Baucus: It will be included.

Mr. LYMAN. I will summarize that.

The planning office for the Institute which is known by abbreviation as ISTC, has been in existence since August, 1978, charged with the responsibility for designing the structure, operating procedures and broad program directions of the institute.

ISTC is planned as a new agency parallel to the agency for international development, the foreign assistance bilateral agency, and will come under the newly created International Development Cooperation Administration which is part of the President's reorganization of the foreign aid program.

The plans for ISTC have been presented to Congress and have been the subject of extensive consideration and debate in the committees, and on the floor, of both Houses. As of this time, the ISTC has been authorized by both Houses of Congress. The Institute's appropriations have been passed by the House of Representatives and are currently under consideration in the Senate.

Pending final action in the Congress, which is expected shortly, the ISTC will become the focus of research and development activities in the United States foreign assistance effort.

ISTC will be a small organization with relatively modest funding. It would focus on helping developing countries improve their capabilities to recognize and deal with priority science and technology problems, affecting their growth and the well-being of their people.

The Institute will support carefully designed and focused programs of sustained research and development that bring together the best scientists and technologists of the United States and of developing countries in cooperative efforts.

The fields that have been identified for attention by the ISTC include agriculture, health, population, nutrition, energy, environment and natural resources, information and communications and the improvement of basic scientific and technological capacity.

The creation of ISTC responds to several needs in our relationships with both the lesser developed and the middle-income developing countries. Some of these are particularly relevant to the subject of these hearings. First, there is the need for better ways to attack the critical problems of poverty in poor countries and in the middle-income developing countries.

Second, the need for better technology to address issues of increasing widespread global importance. These include energy, the conservation and management of natural resources in the environment, and the promotion of rewarding productive employment opportunities for all people.

These are problems that are shared between the United States and countries such as Mexico.

Third, the need for building new problem-solving capability directly in developing countries with the necessary science and technology base.

Fourth, the need for a cooperative system built on mutual respect and close linkages.

Fifth, the need for a much larger involvement of our science and technology community in addressing development problems of the world's poor.

Finally, the need for a wider range of U.S. instruments with which to meet the changing needs in our relations with developing countries, the poor as well as the more advanced, like Mexico.

The ISTC will not have individual country programs, but it will involve specialists and institutions from a variety of countries working on problems which are shared and considered mutual among those countries.

Some of the program plans of ISTC which are likely to parallel Mexican priorities are the following: agricultures—among the new initiatives being explored in the planning for ISTC are programs in the——

Senator BAUCUS. Why do you not summarize more briefly?

Mr. LYMAN. All right.

There are programs in agriculture, such as for arid lands, where some of the poorest farmers work; in health, such as tuberculosis, which is a problem shared between the United States and Mexico; energy, in which the Mexicans have shown increased interests such

as solar and biomass energy for rural areas, and for environmental control, both marine and on land.

In looking to relations with Canada, ISTC would not have direct cooperative programs with Canada on mutual problems. ISTC's mandate is to work with poor and middle-income countries. However, as a developed country with a strong and active science and technology community, Canada is a source of technical information and experience which it has been sharing with Mexico.

Canada has the International Development Research Center founded in 1971 which is a similar institution to ISTC and which has served as a model for many of the elements built into the design of the ISTC. It has several programs with Mexico in health, population and agriculture.

We envisage that the ISTC will coordinate closely with the IDRC on programs related to common problems and, wherever fruitful, enter into three-way agreements between the ISTC, the IDRC and Mexican institutions. Such three-way cooperation could only strengthen the impact of ISTC's participation and overall North American cooperation.

This concludes my testimony and I thank you again for having us here this morning.

Senator BAUCUS. Thank you very much, gentlemen.

I think it would be helpful if we approached the subject from several different directions.

No. 1, let's get down to brass tacks here. What is it that, first, Mexico wants from the United States in the area of science and technological aid, or whatever. What is it, precisely, specifically. How can we help them, from their viewpoint?

All of you have touched on it a little bit, but I wonder if we could horn in on this a little bit more precisely.

Dr. AVERCH. Mexico, as you know, has an economic development plan that has certain goals. They have a science and technology plan that is keyed to meeting those goals. What Mexico would like are projects, research, and assistance, that will help them meet the goals in their science and technology plan which, in turn, will help meet the goals of their economic development plan.

Senator BAUCUS. Well, those are all general concepts. What kind of technology. What more precisely kind of scientific advances are they looking for?

Mr. LYMAN. Well, Senator, among others, the Mexican population is still very largely agricultural and on the land. Even though Mexico now enjoys an abundance of petroleum resources, it is very concerned about the poverty level in the rural areas.

Therefore, agricultural research, particularly related to the more marginal lands where many of the poor farmers live, is a very important issue for Mexico.

Energy; even though Mexico has a great deal of oil, they are concerned about low-cost energy alternatives for the rural areas which may be more feasible for providing energy to the rural areas.

Marine resources are very important to Mexico and that is an area of joint cooperation between the United States and Mexico.

Senator BAUCUS. Well, let's take each of those three and even more delve a little more into each of those three. In the area of

agriculture and marginal land, past productivity, what are they looking at there? You are not talking about agricultural equipment, I do not think, are you? You are talking about different strains of wheat and quantities?

Mr. LYMAN. Well, you will be hearing later this morning from some of the world experts on major crops and I would defer to them on that subject, but I would mention in terms of marginal lands there is need for more research on the type of crops that are more suitable for land that cannot be irrigated. That is where the poorest farmers live, on the land which is most difficult to irrigate.

And there is growing attention now to plants that have been mentioned like jojoba and guayule. Jojoba is a bean which is now being advanced in the southwestern part of the United States because it has an oil base that is almost exactly the same as sperm oil and therefore has a tremendous promise as a commercial crop and it can be grown on very poor, arid land. The Mexicans are similarly interested in this crop.

They are also interested in guayule, which has a latex base. These, and other crops, which could be developed on the poorer lands would give the farmers on those lands a much better economic opportunity than they now have.

Senator BAUCUS. Now, in energy, what technological and scientific aid can we give there, more precisely?

Mr. LYMAN. Well, there was a joint meeting on United States-Mexico scientific and technological cooperation in Houston last December in which energy was discussed and the Mexicans mentioned that they are interested in small scale solar and biomass energy technology which can be used in the rural areas, short of having the major grids and the expensive central grids, extended to the ural areas.

That kind of research is of interest to a lot of developing countries and it should be of interest to the United States as well, and so it is a good example of a common shared problem on which we can work together. The Mexicans have begun doing work on this, so it is not a question of a one-way flow. This is a joint cooperative endeavor that we are talking about.

Senator BAUCUS. And your third area was what, marine plants?

Mr. LYMAN. Marine resources. That is a classic case of where you really cannot study it in one country alone because the resources that you are talking about simply do not respect borders.

There has been, under NSF sponsorship, and other sponsorship, some joint research by the Mexicans and Americans on marine resources but much more can be done, both for developing fish resources and also in learning more about the currents and protecting the marine environment.

Senator BAUCUS. Turning now to Canada, what is it that Canada wants in the area of technology and scientific development?

Mr. PICKERING. Well, I might talk a bit about that. I think in dealing with Canada, we are dealing with a major industrial power whose interests in technology, as opposed to Mexico, go very much to the high side of technology.

So here we are talking about agreements in which the Government is involved. In the area of space, for example, and remote sensing, where we and the Canadians have cooperated since the

early 1960's on devices which can, in a wide range of the spectra available, look at and analyze the land on both sides of the border. In fact, we can do so worldwide. Remote sensing can provide us with up-to-date information on geology, which we did not have before, in helping to find and exploit new areas of natural resources, and look into land use and into crop conditions on a regular basis. There are a wide number of these kinds of activities but I would point out, that is one area in the governmental sphere in which cooperation with Canada is very important.

I would also point out that there are so many nongovernmental interchanges and connections between private firms on both sides of the border which result in the transfer of technology on a rather free basis so that manufacturing goes on in Canada of parts for American-produced pieces of equipment and vice versa; a good bit of our industrial technology moves rather freely to Canada in terms of manufacturing.

These are not cataloged. They are not overseen by the Government except in the broadest kind of way. But they represent the very largest percentage of our science and technology or research and development common interests with Canada. They are not easy to put your finger on, but they generally do go into the industrial area and to the areas of high technology, in the areas that will contribute to Canada's continuing advancement in areas of manufacturer and the use of high technology.

Senator BAUCUS. Does anything else come to mind with respect to Canada?

Mr. PICKERING. Well, we have a lot of joint interests in fisheries, for example. That plays a role and we have a number of cooperative research arrangements in the Pacific in halibut, for example, and which contribute to our joint understanding of the fisheries resource and hopefully contribute to our ability to resolve the problems that exist between us on how that resource should be exploited and conserved.

Senator BAUCUS. To what degree does the United States protect its proprietary interests, patent rights, for example, when in developing greater technological advances, say, with Mexico, whether it is a new strain of product, or a new solar device that somehow is used only in Mexico and not in the United States?

To what degree are we protecting our—I am afraid, you know, that we will develop something and then the Japanese come in or some other country comes in, and though we have developed it, we do not get the benefit out of it.

Mr. PICKERING. Generally speaking, we are dealing in areas where, when we form an intergovernmental agreement, we work out the patent protection right question to the extent that it applies.

Most of this is in technology which already exists in terms of our understanding of the basic science. It is in the application of technology that it makes more sense. Sometimes, that takes on the character of a specific application for a specific region or country or types of countries.

We have tended to view, particularly on the governmental side, those things that contribute to international development, particularly of the poorest countries, and sometimes of the middle-rank

countries, as things that should be made rather freely available, not monopolized. They should be used for the benefit of strengthening our relationships with those countries. Therefore the producer who can best meet the international market, should produce it best at the lowest price, ought to have the opportunity to have that technology available. It is quite hard to lock up, so to speak, that kind of technology.

On the other hand, in dealing with Canada, since the bulk of this is in the private sphere, we look to the companies who have developed the technology to work out their own arrangements in terms of how that technology is to be transferred and what conditions for protection those proprietary rights are to be given with the Canadian company.

And, in the international sphere, as you well know, those are traditionally protected by companies that enter into a joint arrangement, even though it flows across international boundaries.

Senator BAUCUS. You have mentioned several kinds of arrangements in which private interchange with Canada, or governmental in Mexico and we have heard this morning names of various commissions. The Mixed Commission—I do not know what the Mix Commission is, frankly—and some other commissions. You know, the question really is, you know, what is right with all the arrangements that presently exist and what is wrong with the arrangements that presently exist and what recommendations do you have for improving upon them?

From your viewpoints?

Mr. PICKERING. Well, we have looked at this and I think that what basically we are dealing with is not necessarily a series of organizational solutions that are going to answer all our problems. I think that when things are right they generally reflect an attitude of governments and a commitment of personnel and funds and almost with that, the lack of any organization, or the worst kind of organization, can still succeed.

And so the organizational smoothing of the way is, in my judgment, one of the least significant aspects of making a good program work

Organizational solutions in this area have tended to grow up to reflect the degree of intensity that both sides are willing to feel on a reciprocal basis about how they should go ahead, and I think it is no secret that we had a Mixed Commission with Mexico for a long while?

Senator BAUCUS. What is the Mixed Commission?

Mr. PICKERING. The Mixed Commission is a group of United States and Mexican officials who are supposed to oversee our science and technology exchange. It existed for a number of years but did not function very well. When the two Presidents got together and said, "Let's get going," it began to function a great deal better.

Senator BAUCUS. I cannot resist asking whether the results are mixed.

Mr. PICKERING. No, the membership is mixed. I happen to be a member, so I guess I can describe myself as that.

In any event, I think that is the case. The situation with Canada reflects a vastly different set of arrangements where your flow and the commitment and the opportunities are mainly in the private

sector and therefore, the Government does not get involved at all, or rarely so. What government arrangements we have with Canada are more or less treated on an ad hoc basis. Our space officials and their space officials get together on a regular basis. Our environmental officials and their environmental officials get together on a regular basis. It is the same with the fisheries people.

With Mexico we have tried, because of the Mexican Government interest in a wide range of technologies and science to subsume this under one major organization, although there are United States-Mexican cooperative agreements in the government area that lie outside the Mixed Commission, particularly in the fisheries area and the marine science area.

Senator BAUCUS. Can this Congress do anything to help here?

Mr. PICKERING. Well, I think that the main question is money and it is not an inconsiderable——

Senator BAUCUS. Beyond money. There must be something else. If you could put your finger on some other problem besides money. There must be some candidates there.

Mr. PICKERING. Well, I can say quite frankly that your colleagues in the House who have pursued this subject for a longer period of time than in this body have been very instrumental in galvanizing the executive branch to do a great deal more in science and technology cooperation with Mexico, for example.

I can think of Chairman George Brown over on the House side whose personal interest has been very substantial in contributing to, I think, a useful and constructive reaction in the executive branch, particularly in the mission agencies, whose research efforts could, and do, lend themselves to stronger cooperation with Mexico.

And I think that galvanizing impulse has been substantial in contributing to this. But as I said, I think it is attitudinal and I think it is money that does a great deal to help bring this along.

I would also add that there is some mutual interest here. We have talked about what Mexico wants, but there are a number of things that we want, and these tend to go beyond the primary political interest that both countries have in each other.

Princeton Lyman mentioned guayule. We have an awful lot of interest in this country in a source of latex which is not dependent upon foreign imports and so Mexican work in guayule, which has gotten out ahead of ours in many areas, particularly in the cultivation and processing of this crop, is of great interest to us and we have something to gain through joint cooperation, through the mutual commitment of funds in this area, and I think it is important for us to pursue that.

Senator BAUCUS. What has been the public investment in science and technology? What have the Federal appropriations been in each of the last several years, just roughly.

Mr. PICKERING. In basic research and development?

Senator BAUCUS. Or in any terms that you think significant.

Mr. PICKERING. For Mexico and Canada alone?

Senator BAUCUS. Yes.

Mr. PICKERING. I do not think we have been able to isolate those figures. We should be able to get those for you. I can tell you what our total effort is as a nation. It is something on the order of $50 billion in research and development, half of which, or a little more,

is in the Government area and a little less than half of the Government research and development is in the civil area, the nonmilitary area. But those are the gross figures.

I think perhaps maybe one of my colleagues has United States and Mexico funding, but keeping track of the private funding in Canada is an enormous job, for example.

We could try to give you some estimates.

Senator BAUCUS. The best you can, if you could, for the record.

Dr. AVERCH. I have some figures for United States-Mexican relations over the years.

Up until now we have averaged about $200,000 to $250,000 per year in S. & T. projects with Mexico.

Senator BAUCUS. That is NSF, or is that total?

Dr. AVERCH. This is essentially NSF but you will recall that most of the other agencies were not active up until quite recently. So these numbers give you an order of magnitude figure. I expect that, with the encouragement of President Carter, the resources from the other agencies will be more ample than in the past.

Mr. PICKERING. I would think the arid lands meeting in Saltillo which we referred to will itself produce something on several orders of magnitude larger than that for guayule alone next year.

Senator BAUCUS. I appreciate your reference to Congressman Brown. I know he has done a lot in this area. In fact, he sent over a statement for this hearing to be put in the record, which I have yet to read myself.

[The statement of Hon. George Brown follows:]

STATEMENT BY HON. GEORGE E. BROWN, JR.

Mr. Chairman, I would like to compliment the Subcommittee on International Trade for holding these hearings on North American economic interdependence. In an era increasingly marked by international trade problems, a time when we in government are pressed to deal with the problems of individual trade sectors, it is important that we better understand the web of relationships into which these specific problems fit. It is also a time to begin to investigate new forms of economic and political relationships that will allow groups of countries with similar interests to coordinate their efforts in dealing with these problems rather than pursuing independent and frequently duplicative courses of action.

There already exists a great deal of economic interdependence in North America although the nature of this interdependence will undergo some changes in the coming years, with major changes expected in the case of relationships with Mexico. For this reason, and because of my active involvement in U.S.-Mexico relationships in recent years, I will be focusing mainly on that country in my remarks today.

This country has always had difficulties dealing with countries whose economics are more centrally controlled than ours, and Mexico is no exception. The Mexican concept of "patrimonia", the belief that Mexico's resources are held in trust for the benefit of the people, is an example of this centralized control. This situation is complicated by the neglect and arrogance that we have frequently displayed with regard to that country in the past. I recently had the Congressional Research Service compile a list of agreements and treaties in force with Mexico and I was appalled by the length of the list of those that we have let go unused. Many date from World War II, the last time that we needed Mexico for strategic reasons. Now we are beginning a new round of agreements, many dealing with the same subjects. We are reviving many bilateral groups that have lain dormant for years. Mexican political and economic developments are suddenly afforded the same status that similar events in other northern hemisphere countries have always enjoyed. It is no wonder that Mexico questions our sudden sincerity and may be hesitant to tie their economy to any bilateral, or even trilateral cooperation.

Mexican oil and gas discoveries are, of course, the key new factors in developing increased economic interdependence with that country. The many relationships and common problems that we share with Mexico will now have to be dealt with in light of Mexico's new strategic importance. The recent Mexican tomato import case is an

example of a long-standing situation elevated to strategic importance as a result of their energy discoveries and our energy needs. Mexican oil and gas will become the thread that passes through a number of issues, such as immigration, water treaties, technology transfer, and economic cooperation to name a few, causing these to be drawn together and forcing this country to deal with them as a package. We will have to deal with this package of existing concerns and earn the trust of the Mexican government before any talk of a North American Common market can proceed very far.

We have recently signed two bilateral agreements with Mexico, one on arid lands and the other on housing and urban development, and have initiated a number of other cooperative programs under the 1972 U.S.-Mexico Agreement on Scientific and Technological Cooperation. The U.S.-Mexican Mixed Commission, set up under the 1972 Agreement to orient and review operations, has stepped up the meetings of its working groups to deal with the increasing number of initiatives being planned. In September, the Mixed Commission working group on agriculture met to discuss collaborative research on arid lands crops and the meeting was seen as a great success with specific research programs agreed upon. I would like to mention that much of this success is due to the efforts of Assistant Secretary of Agriculture, Alex Mercure, who headed the U.S. delegation. If future working group meetings can do as well, we may make great progress in establishing a pattern of cooperation that will make the idea of a common market approach more feasible.

A word of caution is needed, however, for it is one thing to pursue collaborative research and another thing to finance it. A recent OMB decision is forcing federal agencies to fund this research out of existing domestic programs, causing increased competition for these funds. We in Congress need to be aware of the increased pressure we are placing on the agencies and work to insure that there are sufficient appropriations to conduct joint programs, whether they are with Mexico or China or any other country.

Mexico is in a different state of development than the United States or Canada and we must be mindful of this when we speak of a cooperative economic relationship. What happens when, through our technology transfer and development efforts, Mexico's agriculture industry or steel industry or chemical industry reaches a point where it begins to compete with ours to a greater extent than it does now? It is one thing to seek cooperation today when we possess the technical skills that Mexico needs and they can help us meet our resource needs. But as Mexico develops their industries we may find ourselves having to deal with demands to stem the flow of Mexican imports similar to demands being directed at Japan today. Any discussions of economic interdependence must take this into account and any agreements anticipated must be flexible enough to accommodate Mexican expansion.

We have much to gain from closer relations with Mexico beyond any economic benefits. In working out a mutually beneficial relationship with Mexico, this country will learn how to better deal with other "middle tier" countries throughout the world. We should also recognize and encourage Mexico's desire to play a leadership role among the nonaligned nations. There is great danger in seeking to continue the economic and political relationships of the last thirty years without acknowledging the major changes in the world order that are taking place. We are entering one of those periods of international readjustment that present opportunity for those able to respond and danger to those who cannot. I feel that this country belongs to the first group, but only if we re-examine existing relationships and look for ways to improve them based on information gained from forums such as this.

I'd expect that with some concerted effort on our part to recognize that our cultural past and our geographical closeness forces on us a common destiny, our relationship with Mexico will become as our relationship is with Canada. Sooner or later, this awareness will lead to a new continental awareness.

Senator BAUCUS. Well, I want to thank you very much, gentlemen. I apologize for the brief time here. Our time is running along and we have two more panels we would like to complete this morning, but thank you very much.

Mr. PICKERING. Thank you very much.

[The prepared statements of the preceding panel follow:]

STATEMENT OF THOMAS R. PICKERING, ASSISTANT SECRETARY OF STATE FOR OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS

*Scientific and technical cooperation with Canada*

The United States and Canada are not parties to a comprehensive science and technology agreement, but have carried out their activities through a series of

individual agreements on specific issues which have evolved over time. For example, common fisheries and migratory wildlife have provided a long-standing source of mutual interest for the United States and Canada. We have seen the number of issues of common concern grow over the years, and we have now extended those areas of cooperation to include such issues as acid rain and space.

It is noteworthy that, as in the case of most industrialized nations, much of the scientific and technological cooperation between the United States and Canada occurs through the private sector, including industry and academia. In my view, the combination of our governmental efforts with these broad private contacts have formed the basis for a productive relationship, and have served to complement our over-all diplomatic relationship with Canada. Certainly, shared data bases and exchanges of information have helped us to reach agreements in areas related to natural resource management. Without this scientific cooperation, it is possible that the differences which separate the parties would be much wider.

*International Joint Commission*

The United States and Canada share the world's longest unprotected boundary—4,800 miles. To settle disputes on the use of Boundary waters, to make provisions for the adjustment and settle such questions, the two governments entered into the Boundary Waters Treaty in 1909.

The Treaty established a permanent binational body—the International Joint Commission—composed of six commissioners, three representatives from each government. The commissioners act as a single body rather than as a national delegation. Decisions are made by the Commission based on a majority vote.

Under the Treaty, the responsibilities of the Commission fall into three categories: approving applications to use the boundary waters; investigating and studying border problems; and when requested, monitoring the implementation of the Commission orders and recommendations.

*The Great Lakes Basin Commission*

The Great Lakes Basin Commission is a formal organization of the Great Lakes states and several federal agencies. The Commission, formed in 1967, seeks to plan rational management of the water resource shared by the US and Canada.

The Commission's first task was to arrive at a common data base with respect to the Great Lakes basin resources and their use, and then to analyze this data. The Commission has focussed particularly on the problems of water quality and toxic substances, and water conservation. While the Great Lakes Basin Commission is not a bilateral organization it does maintain close contact with the International Joint Commission and Canadian Government officials.

*Great Lakes water quality agreement*

The Great Lakes Water Quality Agreement was signed in 1978 in order to encourage the restoration of the chemical, physical and biological integrity of the waters of the Great Lakes Basin ecosystem. Both the United States and Canada have agreed to make the maximum effort necessary for a better understanding of the ecosystem, and to eliminate or reduce the discharge of pollutants to the Great Lakes system.

*Transboundary air pollution*

In recent years, there has been increasing recognition that certain atmospheric pollutants travel long distances. Attention has focussed particularly on the problem of acid rain. We have been working with the Canadians on two fronts.

Both countries anticipate signing an agreement in late November under the auspices of the Economic Commission for Europe. The agreement provides for cooperative research, monitoring and information exchange between treaty parties.

The Congress recognized the problem of transboundary air pollution in last year's Foreign Relations Authorization Act (Public Law 95-426, sec. 612), by expressing the sense of the Congress that the President should make every effort to negotiate a cooperative agreement with the government of Canada to preserve the mutual airshed. As a result, preliminary informal discussions have been initiated with Canada to address the acid rain question. It is anticipated that bilateral agreement will be reached to cooperate on this important problem.

*Caribou agreement with Canada*

The United States and Canada expect to negotiate over the coming months a treaty to conserve the caribou which migrate across the border between Alaska and the Yukon Territory. These migratory caribou are a unique natural resource of the American and Canadian peoples. Because the major threats to the caribou—degradation of their habitat, and taking by humans—occur in both countries, successful

conservation of the caribou and its habitat can best be accomplished through an international agreement.

A considerable amount of prepatory technical work has been done to this end by the Department of the Interior. The formal negotiating process with representatives of the Canadian Government is likely to begin this month.

*Scientific cooperation in fisheries—Great Lakes Fishery Commission*

This joint United States-Canadian commission is responsible for research programs intended to maximize productivity of Great Lakes fish stocks of common concern. One of the Commission's principal projects has been the sea lamprey control program, which has been notably successful in reducing populations of this parasitic beast which preys on the lake trout and other valuable species.

*International Convention for the Conservation of Atlantic Tunas*

Article 4 of the International Convention for the Conservation of Atlantic Tunas provides for jointly funded research on the abundance, biometry and ecology of the tuna resources of the Atlantic.

*International Convention for the High Seas Fisheries of the North Pacific Ocean*

This Convention provides for scientific cooperation on salmon and groundfish resources of the North Pacific as well as on marine mammals, particularly Dalls porpoise.

*Convention for the Protection, Preservation, and Extension of the Sockeye Salmon Fishery of the Fraser River System*

This agreement provides for elaborate jointly funded research and management on Pacific salmon resources of the Fraser River System

*Convention for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea*

This agreement provides for a program of research and management for the halibut fishery of the Pacific Northwest and Alaskan coast.

A protocol amending the existing convention is presently before the Senate for ratification. Although the protocol would change several aspects of the existing treaty, joint United States-Canadian research on halibut stocks would be continued.

*North American Migratory Bird Treaty*

The United States has sought to renegotiate existing treaties regarding the protection of migratory species of birds. These treaties have been important instruments in protecting migratory birds, particularly during their nesting season and through regulation of hunting.

We have recently concluded the negotiation of a treaty on migratory birds with the Soviet Union, and we have used this text as a model for the renegotiation of other agreements, including our existing agreement with Canada, so as to achieve some consistency in the management scheme.

The migratory bird treaty with Canada has been especially useful in protecting ducks such as the canvasback duck and the redhead duck. The Canadian-United States treaty contains some very restrictive provisions regarding the hunting of migratory game birds. Hunting is prohibited between March 10 and September 1, the period when waterfowl are most available and the most needed for food in the far North. There are exceptions in the treaty for subsistence hunting outside these dates, but they apply only to Indians and Eskimos and to certain species that are either not generally available or not traditionally utilized in most northern areas. As a result, subsistence hunting for migratory birds, as practiced for generations in Alaska, is for the most part illegal, thereby protecting this national resource. An agreement with Canada amending the existing migratory bird treaty was reached early this year. The new agreement contains liberal subsistence hunting provisions along the lines of the U.S.S.R. treaty.

*Energy*

A Memorandum of Understanding on cooperation in R&D related to tar sands and heavy oils was signed between the United States and Canada on June 4, 1979. Cooperative efforts under the MOU should speed resolution of outstanding technological problems while reducing technical risks and shortening the time needed to develop new technologies. The importance of the agreement is seen from the fact that United States and Canadian reserves of heavy oil and tar sands are placed at 100 billion and 800 billion barrels respectively. By comparison, conventional oil reserve in the United States are estimated at 29.5 billion barrels and in Canada at 7.5 billion barrels.

The United States has a long history of mutually beneficial cooperation with Canada in the peaceful uses of nuclear energy. Our nuclear cooperation agreement with Canada was one of the first such agreements, dating back to 1955. Pursuant to the Nuclear Non-Proliferation Act of 1978, we have been negotiating with the Canadians on updating the agreement and incorporating the upgraded requirements in the Act.

*Space*

Our relations with Canada in space cooperation have been long and fruitful. the first United States cooperative satellite project, the Alouette experimental meteorological satellite, took place with Canada in 1962. NASA subsequently provided the launch vehicle for a Canadian-built experimental communications satellite, the CTS, for sending direct broadcast TV signals to remote areas. This satellite is still operating, with each country utilizing the satellite on alternate days.

A particularly active area in United States-Canadian space cooperation has been remote sensing. Canada operates two ground stations for the reception of Landsat data and has one of the most active programs in the world for the application of Landsat data to natural resource needs. Canada also particiated in the United States/Seasat experiment, receiving data directly from the satellite and providing information and analysis of value to both countries, particularly with regard to sea-ice conditions. In the near future the United States plans to discuss with Canada the potential for harmonizing our remote sensing programs so that they can be planned and operated as economically as possible and provide the maximum benefit to users throughout the world.

*Scientific and technical cooperation with Mexico*

When Presidents Carter and Lopez Portillo met in Mexico City in February of this year, they agreed to strengthen the mechanisms for scientific and technological cooperation between the two countries. During the Mexico City summit, a Memorandum of Understanding was signed, which provided for specific steps in this direction. I would like to submit this document for insertion in the record, if the Subcommittee has no objection.

As a follow-up to the Mexico City discussions, the United States-Mexican Mixed Commission met in Washington in early June.

The Mixed Commission is composed of representatives of the Department of state of the United States and of the Secretariat for Foreign Relations of Mexico; the executive agencies for the Agreement, NSF and CONACYT; and representatives of agencies of both countries designated by the Department of State and the Secretariat for Foreign Relations. As a rule, the commission meets every two years, but can meet more frequently by mutual agreement if necessary.

At its meetings, the Mixed Commission reviews and evaluates existing activities under the Agreement and determines the plan of activities to be undertaken in the future. The Commission may make decisions on procedures to be followed. The commission may also make recommendations to the two Governments for specific measures to strengthen cooperation.

To support the Mixed Commission and to ensure the continuity of activity between meetings of the Mixed Commission, a coordinating group has been established. The group maintains close working contact and meets formally at least once a year.

At its meetings, the coordinating group reviews the progress of ongoing work and discusses means for facilitating this work. The coordinating group also is responsible for preparing a joint report on the progress of activities taking place under the auspices of the Mixed Commission. Between meetings of the Mixed Commission, the coordinating group may receive and discuss proposals from the working groups for alterations or additions to the approved plan of activities.

Each side is responsible for financing its own participation in cooperative activities according to its internal procedures, unless otherwise mutually agreed.

As a result of the Carter-Lopez Portillo discussions in February, we have seen the Mixed Commission take on a new life. The most recent example of this renewed commitment to scientific and technological cooperation is in the area of new crops. I will address this particular point in my following discussion of the working groups, but I would like to state for the record that, in my view, the ongoing scientific and technological cooperation with Mexico represents one of the truly positive areas of our overall relationship with Mexico.

I would like to now turn to a discussion of our participation in the working groups.

*Arid lands and agriculture*

A United States-Mexico preparatory group met April 16-18 to review proposals in the areas of new crops; desertification control; soil, water and resource conservation; and productivity of livestock and conventional and forage crops. The program was adopted by the Mixed Commission at its meeting in June, at which time it was agreed that a new Working Group should be formed under the Mixed Commission on Arid Lands, New Crops and Agricultural Productivity. The working Group involves participation on the U.S. side by the Department of State, USDA, Interior, NSF, Commerce, NASA, and ISTC. Mexican membership includes CONACYT the Secretariat for Agriculture and the Commission for Arid Lands.

Subsequently, the first meeting of the Working Group took place in Saltillo, Mexico September 10-14 which the Mexicans characterized as "a breakthrough" in U.S.-Mexican science and technology cooperation. Indeed, from the United States perspective, the meeting was a giant step forward in arriving at a mutually beneficial plan of action which could be of great benefit to the Southwestern United States in particular.

Agreement was reached to cooperate on specific projects in the areas of arid lands, forestry, new crops and the Man and the Biosphere Program. Of particular interest has been cooperation in the development of Guayule (a source of rubber from desert plants) which would provide important economic benefits to border areas.

In addition to the progress which was made in the new crops area, the parties agreed to increased contacts in developing United States and Mexican plans for combating desertification and for regional monitoring. Significant collaborative efforts were identified in soil and water conservation, livestock production and conventional crops, and in training of Mexican researchers.

*Energy*

The Energy Working Group consists on the U.S. side of representatives from the Department of Energy, the Geological Survey and the Solar Energy Research Institute. Mexican representation is from the Petroleum Institute, URAMEX, Institute for Electricity Studies and the Center for Scientific Research. This working group os currently engaged in some 20 separate projects in 7 research and development areas. Some projects involve research on alternative energy sources, particularly solar and geothermal energy. Other projects are related to the management of energy resources, such as planning and costing of new energy resources and conservation of industrial energy. Initial implementation of the projects has begun on almost all projects with exchanges of personnel and technological information. Joint research and development has been agreed to in the geothermal energy field. A planning meeting on alternative energy sources is scheduled for Washington in the fall of this year. One of the projects under discussion at this time will be the establishment of a demonstration solar energy village in Ajuchitlan, Mexico, which will be known as the Suncalli project.

Outside of the Mixed Commission, we have had significant nuclear cooperation in the peaceful uses of nuclear energy, primarily in the supply of reactors and fuel to Mexico for research and power uses. Our cooperation in this area has taken place through trilateral arrangements with the International Atomic Energy Agency, rather than under a bilateral agreement for cooperation.

*Railway transportation, industrial metrology, and technical information transfers*

The Railway Transportation, Industrial Metrology and Technical Information Transfers Working Group efforts are aimed at exchanges of personnel and information, and the training of specialists. Its membership is from the Department of Transportation in the United States and the Secretariat of Communications and Transport in Mexico. We have begun to implement a plan of action, which has included the education of Mexican specialists in the United States for testing of rail cars, equipment and materials; safety training; and training for rail equipment construction.

*Basic science*

The Working Group on Scientific Research Cooperation deals with the joint research programs of CONACYT, the Mexican science agency, and the National Science Foundation. These institutions are the only members of the Group. The program has been stepped up and a detailed planning review is scheduled to take place in Mexico City in November by the Directors of the two concerned agencies.

*Housing and urban development*

In February of this year, the United States and Mexico signed a separate agreement on the subject of Housing and Urban Development, although the actual work

occurs through the Mixed Commission. The Agreement is implemented by the U.S. Department of Housing and Urban Development and by the Department of Human Settlements and Public Works for Mexico. The agreement created a Joint Committee to select specific areas in which Housing and Urban Development and the Ministry of Human Settlements and Public Works would exchange information, including aspects of national and regional urban development policies and plans for border population centers. Plans for jointly conducted seminars and training programs have progressed rapidly. Several joint programs have already been held, in the field of urban housing finance.

The United States and Mexico also cooperate in a number of areas through independent formal and informal agreements. I would like to now turn to those areas.

*Wildlife and conservation exchanges with Mexico*

An informal United States-Mexican Joint Committee on Wildlife Conservation was established by the U.S. Fish and Wildlife Service and its Mexican counterpart, el Direccion General de la Fauna Silvestre, in 1975 in order to coordinate cooperative work in the wildlife field. The Joint Committee meets once a year, alternately in the United States and Mexico.

The majority of the scientific work is the responsibility of individual project leaders. Private sector groups, such as the National Audubon Society, National Wildlife Federation, and the Texas and New Mexico Departments of Fish and Game also carry out programs under the Joint Committee.

Significant work has been done, for instance, in the endangered species area to determine the populations of Mexican wolf and grizzly bear. Studies have been conducted on the California condor, masked bobwhite quail, and other species of common interest. Joint field research has been carried out in Baja, California, where experimental study plots have been established for habitat monitoring.

*International Boundary and Water Commission*

Signed in 1944, the United States-Mexican Water Treaty, which applies to rivers and coastal waters, provides that the two governments give preferential attention to the solution of all border sanitation problems. The Water Treaty charges the International Boundary and Water Commission with carrying out the terms of the Treaty. Since that time, a number of projects affecting small, intermediate and large adjoining communities along the American and Mexican border have been addressed by the Commission. On September 27, the Commission concluded an agreement providing for implementation of the treaty through the Commission to resolve permanently all the existing water pollution problems along the border.

*United States-Mexican scientific fisheries and marine mammal cooperation*

During the past few years, United States and Mexican scientists have been involved in cooperative scientific research programs concerning fisheries in the Gulf of Mexico. While not formally institutionalized it is hoped that this work can be continued.

United States and Mexican scientists have been involved for a number of years in joint meetings with U.S. scientists from the National Marine Fisheries Service and the State of California to share information and to do joint work on Pacific coast fisheries of mutual concern. Some of the most important work has been done on the shared anchovy stock which is fished off both California and Mexico.

The United States and Mexico have cooperated for many years in the scientific work being carried out by the Inter-American Tropical Tuna Commission (IATTC). While this work is done mostly by IATTC scientists, the member governments and their scientists cooperate with the Commission in a number of ways. Mexico, although no longer a member of IATTC, has indicated that it will continue to cooperate in the scientific work of the Commission.

United States scientists have been studying marine mammals in the waters of Mexico for several years. These studies usually include provisions for participation to some extent by Mexican scientists. However, extensive and truly joint research on marine mammals between the United States and Mexican scientists began in 1978 when a meeting was held in Seattle to discuss possible joint research activities. Since then several similar meetings have been held in both Mexico and the United States, and it is expected that such meetings will continue on an annual basis.

The most extensive cooperative work is presently being done on the gray whale. Work is also underwaay or planned on a survey of eastern tropical Pacific cetaceans, fisheries interaction with small coastal marine mammals, and tropical dolphin biology. The research will be expanded to other areas as funding and personnel on both sides permit.

*United States-Mexico environmental program*

Entered into in 1978, between the Environmental Protection Agency and the Mexican Sub-Secretariat on Environmental Protection, the United States and Mexico will address areas of mutual concern on environmental protection through a Memorandum of Understanding. Initially, a joint monitoring program was undertaken in the San Diego-Tijuana area on air pollution. Similar programs are envisaged at the other border locations, e.g. El Paso, Ciudad Juarez. Building on the results of the monitoring prograam, abatement strategies will be devised.

*United States-Mexican Migratory Bird Treaty*

The United States has sought to renegotiate existing treaties regarding the protection of migratory species of birds. These treaties have been important instruments in protecting migratory birds, particularly during their nesting season and through regulation of hunting.

We have recently concluded the negotiation of a treaty on migratory birds with the Soviet Union, and we have used this text as a model for the renegotiation of other agreements, including our existing agreement with Mexico, so as to achieve some consistency in the management scheme.

The existing agreement on highly migratory birds, which was signed in 1936, was closely patterned after the 1916 agreement with Canada. It established a hunting season, required hunting permits, and clled for the establishment of refuge zones. The Mexican treaty has been noteworthy in the contribution it has made to the portection of raptors (birds of prey) such as the peregrine falcon. the treaty does not, however, create any exception for subsistence taking. The Department of the Interior has informally sounded out its Mexican treaty along the lines of the recently negotiated treaty with the Soviet Union and the amendment to the Canadian treaty.

*Population*

The Government of Mexico recognized the serious problems posed by excessive population growth and a comprehensive national population program has been launched. There are no bilateral rsearch and development family planning activities carrier on with Mexico. United States support is conveyed indirectly through private and international organizations and not on a government-to-government basis. Our population support to date, provided trhough such organizations as the Populations Council and Columbia University, amounted to $12.5 million in the form of contraceptives, training and consultancies.

---

SUMMARY OF THE MAIN POINTS INCLUDED IN DR. HARVEY AVERCH'S STATEMENT TO THE SENATE SUBCOMMITTEE ON FINANCE AND INTERNATIONAL TRADE

Origins and history of the 1972 United States-Mexico Agreement of S&T Cooperation.

NSF role in the management of the S&T Cooperative Science Program.

Description of the Executive Agency role and the Cooperative Program.

Procedures and mechanisms of cooperation.

Types of activities, examples, benefits.

Significance of President Carter's February visit to Mexico.

June meeting of the Third Mixed Commission of United States-Mexico S&T Cooperation.

Results of the Mixed Commission meeting.

NSF Program for the next two years.

---

STATEMENT OF DR. HARVEY AVERCH, ASSISTANT DIRECTOR FOR SCIENTIFIC, TECHNOLOGICAL, AND INTERNATIONAL AFFAIRS, NATIONAL SCIENCE FOUNDATION

Mr. Chairman and members of the subcommittee, I am pleased to appear before you to discuss the National Science Foundation's role in implementing the United States Agreement with Mexico on Cooperation in Science and Technology. I will also suggest how this agreement between the two countries can be considered a form of international trade in which each country exercises its comparative advantage for the benefit of both.

The visit of Mexican President Louis Echeverria Alvarez to Washington in 1972 resulted in the first agreement on science and technology cooperation between the two countries.This agreement, was important to NSF because the Foundation was designated as the executive agency for U.S. implementation of the cooperative effort and the procedures that evolved for working with our Mexican colleagues served as

models for NSF cooperative science programs with other Latin American countries, most notably Brazil.

Let me first describe what an executive agency is expected to do under a cooperative science agreement and then discuss the way NSF has proceeded with its colleagues in Mexico and other Latin American countries.

An executive agency, in principal, is a planner, coordinator, facilitator, seeker of funds for core support of the program and, when necessary, provider of "seed money" for the planning and participation of other Federal agencies. In these activities the executive agency works with, and reports annually to, the Department of State.

In the first few years of the Agreement, participation by agencies other than the National Science Foundation and its Mexican counterpart, the Mexican National Council of Science and Technology (CONACYT), was very limited. This has been changing gradually in the last few years, and especially this year since President Carter visited Mexico.

Both NSF and CONACYT used their own resources in the implementation of the cooperative science program. The internal competition for resources meant that both used their general criteria and procedures and did not establish special reviews and funding procedures unique to the program. These general agency criteria and procedures shaped the initial stages of the program.

NSF criteria and procedures implied relative priority for support of research which would provide incremental benefits to U.S. science. CONACYT, however, saw the program as a complement to Mexican national priorities in science and technology. These, in turn, were related to goals for social and economic development. Although technical excellence was a necessary condition on both sides, it could not be sufficient, because of the asymmetric goals held by the two parties.

Rules and procedures were then worked out to determine which, among the set of all meritorious proposals, would be funded. Thus, United States and Mexican scientists submit joint proposals to NSF and CONACYT. Each agency then reviews the proposals, using its own review system and its own standards and priorities. Twice a year the two agencies draw up their own priority listings of all proposals in competition. These lists are then compared and melded. Projects are then selected in order until funds are exhausted.

Over the years, the cooperative program has tended to support three principal types of activity:

(1) Scientific visits for program development or for an activity in which a United States or Mexican scientist needs to visit the other country for a limited time of up to four weeks;

(2) Workshops in either country where a small number of scientists from both countries discuss past or proposed work in a discrete area of science. These workshops may be advisory to NSF and the Mexican Council for development of new areas of cooperation. Last year, for example, workshops were held in oceanography and tropical biology;

(3) Cooperative research projects in which scientists from both countries conduct research in the others' country or in both countries, depending upon the subject matter.

The program has supported projects across disciplines and across basic and applied research. In the past, the program has supported a dozen or so projects each year at an annual U.S. cost of about $200,000. The Mexican participation is paid for by CONACYT and the U.S. participation by NSF. The subject matter ranges from guayule research to fundamental physics. In fiscal year 1978, awards totaled about $260,000. I estimate that the program will support about 20 projects and scientific visits in fiscal year 1980 at a cost of slightly more than $300,000. The figures show that activity in the program has increased in recent years. We expect that the program will continue to grow.

Under the rules for the program, the overall set of projects must produce a rough balance in benefits for each country. Mexico gains information relevant to the priorities in its S&T development plan—particularly basic research, where the United States has a comparative advantage. The United States gains access to unique sites for research in the natural and social sciences. The exchange benefits both sides. Let me give you some examples of such projects:

1. Several projects in geology, geochemistry, geochronology, and geological exploration have led to the development of better prospecting techniques for copper exploration in both countries. The projects have involved the Universities of Iowa and Arizona, the U.S. Geological Survey, the Mexican National Council for Natural Resources, the Mexican Geological Survey, and the Universities of Sonora and Mexico.

2. A project on migration patterns within Mexico and from Mexico to the United States has pooled resources of the Colegio de Mexico, the Mexican National Autonomous University, the Mexican National Institute of History and Anthropology, and the University of Arizona.

3. Several groups of physicists and mathematicians from both countries have worked on problems of relativity physics. The participating scientists came from the University of Texas, Brown University, Princeton University, The Mexican National Autonomous University, and the Mexican National Polytechnic Institute.

4. The University of Arkon has been and is currently cooperating with the Mexican Center of Applied Chemistry Research in Saltillo on joint evaluation of the chemical and physical structure and characteristics of guayule rubber to determine its comparability to hevea rubber. This is a necessary step which may make large scale production of rubber economic.

5. NSF and CONACYT are also supporting the continuation of ecological and floristic studies of species native to the region of Veracruz in Mexico. With the aid of computer compilation, a classification of tropical plant species is being carried out jointly between the U.S. Field Museum of National History and the Mexican Institute of Research on Biotic Resources. This is a useful basis for planned resource management in tropical forestry and agriculture.

As a result of President Carter's visit to Mexico, a Memorandum of Understanding was signed between Dr. Benjamin Huberman of the White House Office of Science and Technology Policy and Dr. Edmundo Flores, the Director General of CONACYT. This Memorandum of Understanding set an agenda for discussions leading to the Third Meeting of the United States-Mexico Mixed Commission for Science and Technology Cooperation which was held on June 7 and 8, 1979, in Washington.

The Mixed Commission Meeting streamlined the coordination and management of the cooperative programs in S&T between the two countries. Technical working groups have been set up to report to the Coordination Group comprising the Executive Agencies of both countries, the U.S. Department of State, and the Mexican Ministry of Foreign Affairs. The Coordination Group now meets every six months to review progress on the work of different participants under the United States-Mexico cooperative programs.

Six working groups have been formed as a result of the Third Mixed Commission Meeting; they are: Railway Research and Development; New Crops, Arid Lands and Agricultural Productivity; Energy Research and Development; Industrial Metrology and Instrumentation; Technical Information Transfer; and NSF-CONACYT Cooperation. Within the working groups the cognizant agencies such as DOT, DOA, DOE, DOI, and Commerce play a lead role.

Under the NSF-CONACYT Work Program, the following areas of cooperation have been outlined for the next two years: Marine Sciences; earth sciences, including earthquake engineering and seismology; tropical biology and ecology; human nutrition; biosaline research; atmospheric sciences; archaeology and anthropology; and health research. These areas will be stimulated through the scientific visits, seminars and scientific workshops and cooperative research projects. These priorities were agreed to as being of mutual interest, and consistent with the national priorities of each nation. I believe new work will increase the breadth and depth of our programs, while enhancing reciprocal S&T benefits. These reciprocal benefits in turn will enhance our overall political and economic relations with Mexico.

This concludes my formal statement, Mr. Chairman. I will be pleased to answer any questions that you or other members of the Subcommittee may have.

---

### Testimony of Princeton N. Lyman, Director of the Institute for Scientific and Technological Cooperation, Planning Office

Mr. Chairman, and members of the subcommittee, it is a pleasure to have this opportunity to testify before this Subcommittee on the subject of scientific and technological relations between the United States and Mexico, and between the United States and Canada. I represent the Planning Office of the Institute for Scientific and Technological Cooperation (ISTC). The Planning Office has been in existence since August 1978, charged with the responsibilty of designing the structure, operating procedures, and broad program directions of the Institute. The ISTC's Plan was presented to the Congress in early 1979 and has been the subject of extensive consideration and debate in the committees and on the floor of both houses. Many of the improvements in the Plan are directly attributable to the close scrutiny and constructive suggestions received during this period. The ISTC Planning Office has also benefitted from the contributions of the best scientific and

policy minds in the government, academic, private business, and philanthropic foundation communities at home and abroad.

As of this time, the ISTC has been authorized by both Houses of Congress. The Institute's appropriations have been passed by the House of Representatives and are currently under consideration in the Senate. Pending final action in the Congress, which is expected shortly, the ISTC would become the focus of research and development activities in the United States foreign assistance effort. It would be a small organization with relatively modest funding that would help developing countries improve their capabilities to recognize and deal with priority science and technology problems affecting their growth and the well-being of their people. The Institute would also support carefully designed and focused programs of sustained research and development that bring together the best scientists and technologists of the United States and developing countries in cooperative efforts. In many—hopefully most—cases, because of the strength exhibited by many developing countries in these fields, and because of the capacity-building that comes from being engaged in research, ISTC grants and contracts for specific undertakings would be awarded to scientific and technical organizations and individual researchers in developing countries. In other cases, however, these awards and contracts would be made to United States organizations, for collaborative research with developing countries and for specialized research of importance to developing countries. In any event, the large majority of expenditures under the programs of the ISTC would be made in developing countries themselves, and the activities would be carried out—from the first identification of priority problems, through the planning and design stages, to actual implementation and evaluation—on the basis of equal standing of the participants from the United States and from developing countries.

The fields identified for immediate attention by the ISTC include agriculture, health, population, nutrition, energy, environment and natural resources, information and communication, and the improvement of basic scientific and technological capacity.

If United States programs of assistance and our approach to relations with both the less-developed and the middle-income developing countries are to be increasingly productive, certain important needs should be addressed more effectively. These needs include:

1. The need for better ways to attack the critical problems of poverty in poor countries and in middle-income developing countries. This need for new and more readily applicable technologies in food and agriculture, health, population, and education and human resource development that benefit people directly is an essential element if we are to overcome the worst physical manifestations of poverty on a worldwide basis by the year 2000.

2. The need for better technology to address issues of increasing widespread importance—the global issues of the decade ahead—including, for example, (a) energy; (b) the conservation and management of natural resources and the environment for human use; and (c) the promotion of rewarding, productive employment opportunities for all people.

3. The need for building new problem-solving capability directly in developing countries with the necessary science and technology base. To assure a reasonable and healthy measure of self-reliance and suitable attention to important local problems, countries must be substantially independent in science and technology as in other important areas of endeavor.

4. The need for a cooperative system built on mutual respect and close linkages, collaboration, and exchanges between the science and technology communities of the United States and those of developing countries. As the scientific and technical capabilities of those countries increase, as they have in many of the middle-income countries, we are finding that we share many scientific, economic and political interests. Mexico is an example.

5. The need for a much larger involvement of our own science and technology communities in addressing development problems. Only a very small share of the U.S. science and technology research and development communities—either public or private—are engaged in research focused directly on the problems of the poor, and yet their involvement could substantially accelerate accomplishment in developing countries.

6. The need for expanded activities by the U.S. private industry and business sector to accelerate progress in developing countries. The great scientific and technological strength of U.S. industry, if brought more sharply to bear on meeting development needs, would make a substantial difference in specific countries where the local situation is right.

7. The need to create a better environment in which to negotiate and deal with issues related to proprietary technology. The transfer of private technology is ac-

companied by sensitive and difficult issues which can best be managed within national settings in which the science and technology communities and infrastructure organizations are well formed and active.

8. Finally, the need for a wider range of U.S. instruments with which to meet changing needs in our relations with developing countries, the very poor as well as the moderately advanced. We need an array of tried and tested official operating instruments—from fully concessionary assistance to completely reimbursable programs, with many gradations between; and from one-way short-term assistance to longer-term and mutually beneficial collaboration. In many cases, it should be possible for middle-income developing countries to become the analysts and interpreters of the development problems of poorer countries, and to be the primary collaborators in building up scientific and technological capabilities of the poorer countries. The world is complex and changing. In our own interest, our response must be proportionately adaptive and creative.

These eight needs are very real and we have numerous examples of their importance. The Institute for Scientific and Technological Cooperation has been designed to address these needs in new and vigorous ways. It would operate as one element of overall U.S. development assistance, leading and coordinating the important sector of scientific research and exchanges for development.

Although the ISTC is not yet in operation, extensive work has already been undertaken in collaboration with experts at home and abroad to develop "illustrative" program plans. These illustrative plans have provided a basis for understanding and evaluating the proposed directions of the ISTC and for stimulating constructive suggestions as to how these preliminary ideas may be shaped to fit more nearly the priorities and preferred operating procedures of relevant organizations in developing countries and the United States. As noted earlier, the ISTC is oriented to major world problems in scientific and technological aspects of the development of poor and middle-income countries. The ISTC will not have individual country programs, but will involve specialists and institutions from various countries, as appropriate to long-term, sustained cooperative attacks on problems of mutually agreeable priority. The ISTC's programming process will draw such specialists and institutions into flexible early-stage explorations of problem identification analysis and priority ranking. These will lead to the development of problem statements and strategies or plans of work for dealing with these problems. Once a reasonable consensus exists on these statements and strategies, it will be possible for the ISTC to receive and evaluate proposals from interested and qualified organizations which would like to assume responsibility for one or another aspect within a general strategy and plan of work. These procedures are currently being worked up in detail by the ISTC Planning Office. It would be necessary for ISTC to help find ways to facilitate approaches from developing country institutions which are not as familiar with U.S. organizations and operating methods. For U.S. government agencies interested in the subject matter fields that will occupy ISTC, but lacking strong clear authorities to operate in international arenas for the purpose of assisting the science and technology efforts of developing countries, the Institute could serve as a lead agency, providing funding and coordination for the application of the expertise of these agencies to cooperative programs of research and development and capacity building.

Among some of the program plans of the ISTC which are likely to parallel Mexican priorites are the following:

*Agriculture.*—Among the new initiatives being explored in the planning for the ISTC are programs in the evaluation and promotion of the potential of certain underutilized plants, such as jojoba (a source of an industrial wax) and guayule (a source of rubber latex), which may have potential as crops with a significant market. An ISTC representative was present at the recent successful meeting of the United States-Mexican Mixed Commission work group on Arid Lands, New Crops and Agricultural Productivity, held last month in Saltillo, Mexico. The outcome of the meeting has helped further the ISTC's thinking, and has permitted refinement of ISTC's plans in this area, to more nearly conform to the priorities and methods of operation preferred on the Mexican side, and to the interests of other U.S. Agencies on the American side. Much remains to be discussed before actual programs involving Mexico are decided upon after ISTC comes into existence. However the prospect for cooperation is encouraging.

The ISTC is also planning agricultural undertakings that have to do with systems on farming on marginal lands, one example of which includes the arid and semi-arid regions of the world. Mexico has areas which fall into this category. Not only are jojoba and guayule found in such regions, but also some better known dry zone crops that might be produced with or without irrigation: and also foraging livestock

whose management, and the management of the range plants on which they feed, could become subjects of joint study.

*Health.*—In contributing to the attack on major tropical diseases, the ISTC is preparing plans in (1) systems of delivering primary health care; (2) water and sanitation; (3) tuberculosis; and (4) the comprehensive control of specific insects, rodents and other animals which act as vectors in the transmission of disease. Tuberculosis, for instance, is an important public health problem in many countries, including the United States and Mexico. Methods of detection and treatment of the disease, and of its prevention, differ in different areas of occurrence for reasons not yet fully understood. Cooperative work involving Mexican and United States scientists, and those from other countries, could result in practical methods for the control of this disease that are not now known. The other health topics listed may also contain elements which are of priority to Mexican public health authorities, and should be discussed further.

Closely associated with the ISTC's work in health, are its interests in the improvement of population programs. The experience of the Canadian International Development Research Centre (IDRC) has provided a pattern which ISTC will consider following in its discussions with Mexican institutions and scientists. IDRC has several significant collaborative research projects supported at Mexican institutions on human reproduction, and on population policy. ISTC also has program interests in the improvement of human nutrition. This subject is likely to be of interest to the Mexican science and technology community, as it is to countries in other areas of the world.

*Energy.*—The field of energy research and development, being overshadowed by the uneven distribution and declining reserves of oil, and the development and management of nuclear power, has not yet given sufficient attention to the exploration and promotion of alternative—primarily renewable—sources of energy. The Institute intends to look closely at the available alternatives and the means by which the long term development of desirable alternatives can be undertaken by individual nations. Sunlight, the conversion of biomass, and the analysis of conventional fuels such as coal are among the topics likely to occupy ISTC's attention. Mexican scientists have expressed interest in some or all of these subjects. The need for national energy policies is now widely recognized. ISTC will explore the possibility of supporting cooperative research in the difficult area of energy policy making.

*Improved processes of technological cooperation.*—Many of the problems in technological transfer and adaptation arise from poor policies regarding domestic market development, foreign exchange or goals in agriculture, industry, transportation and communications. Also, insufficient effort has been made to look for opportunities as well as obstacles for improved technological cooperation through the private sector. The ISTC will explore the possibilities of supporting policy studies on the introduction, assessment, transfer, and adaptation of technologies through both government and private channels. One aspect of these policy studies would be the identification of those technical areas which would provide mutual benefit to both the United States and other participating countries. Mexican authorities will be among those contacted as possible participants in the exploration of problems in this area, and of the means of dealing with these problems.

ISTC relations with Canada are of a different magnitude and character than those with countries in the developing areas. ISTC's mandate is to work with poor and middle-income countries. However, as a developed country with a strong and active science and technology community, Canada is a source of technical information and experience which it has been sharing with Mexicans through its International Development Research Centre which is a similar institution to ISTC and which has served as a model for a number of the elements built into the design of the ISTC. It is unlikely that the ISTC could become involved in United States-Canadian science and technology cooperation focused on their shared domestic interests. However, we envision that the ISTC will coordinate closely with the Mexican programs of the IDRC and wherever fruitful enter into three-way agreements between ISTC, IDRC, and Mexican institutions and specialists. Such three-way cooperation could only strengthen the impact of ISTC's participation.

This concludes my testimony. It is an honor for ISTC to be involved by this Subcommittee in its consideration of the vital topic of science and technology relations with our nearest neighbors.

Senator BAUCUS. Our next panel consists of Dr. John Pino, director of agricultural sciences, the Rockefeller Foundation, and Dr. Norman Borlaug, director, wheat program Centro Internacional de Mejoramiento de Maiz Y Trigo.

Gentlemen, it is an honor and a privilege for this subcommittee to have you here this morning. Your reputations have preceded you—favorably, I might add—and I am glad to have you here.

I do not mean to bore you with introductions and praise, but I would like to hear what you have to say.

Mr. PINO. Thank you very much, Mr. Chairman.

I will give a very brief statement this morning, Mr. Chairman, and with your permission, I would like to leave a prepared statement for your consideration.

Senator BAUCUS. It will be included in the record.

## STATEMENT OF JOHN A. PINO, DIRECTOR OF AGRICULTURAL SCIENCES, THE ROCKEFELLER FOUNDATION

Mr. PINO. What we would like to talk about this morning are action programs—what has been done, not what we plan or what has been planned.

I myself had the privilege of working for 10 years in Mexico as a member of the foundation's team of agricultural scientists in a cooperative effort with Mexican scientists to develop and strengthen the research, education, and extension base so vital for the agricultural development process.

I am pleased to have this opportunity, Mr. Chairman, to appear before this committee along with my colleague, Norm Borlaug, who has been on the field staff of our program in Mexico for 36 years.

Also, Mr. Chairman, with your permission I would like to mention, too, the presence of Senor Julian Rodriguez Adame, a former Minister of Agriculture of Mexico and formerly Mexico's Ambassador to Japan.

Senator BAUCUS. We are very happy to have you here this morning, sir.

Mr. PINO. Unfortunately, Mr. Adame is here as an observer and not as a witness, and I was pleased to hear you this morning say that your next meeting is scheduled to be in Mexico City, so you will have an opportunity to hear Mexican witnesses.

Senator BAUCUS. I wish it were. So far, it is scheduled to be in New Mexico. We will work on Mexico City.

Mr. PINO. Mr. Adame is a warm friend and a good agricultural scientist and was instrumental in the success of the foundation's program activities in Mexico.

Our program began as a modest effort, but one with terribly ambitious goals, and to show you how modest, it began with a budget of $25,000, aside from its staff; it went up to $60,000 a few years later; and the maximum, its annual budget was $450,000 aside from staff salaries.

Our staff remained small, reaching a maximum strength of 18 scientists in 1958 and focused on the basic food commodities including corn, wheat, beans, potatoes, vegetables, poultry, and livestock and these still remain important items in Mexico's agriculture.

The important thing was that our staff worked shoulder to shoulder with Mexican colleagues. This was no usual technical assistance program. We never, in fact, used that terminology.

It was a cooperative research and training program.

Mexico was a full partner, financially and professionally. Research conducted on experimental stations was followed by trials

done in farmers' fields. Yields were low. We needed to know why and how to increase these.

It is important, first, to understand the problem and then to ask the right questions. Field work was, and still is, the essence of both.

With the crops, the main research activity centered on collecting and using germ plasm from wide sources, emphasizing breeding techniques for increasing yield and disease resistance in response to fertilizer and agronomic trials to understand planting time effects, irrigation, and fertilization. Dr. Borlaug, I am sure, will expand on some of these details.

In the animal research area, we emphasized the formulation of feeds based on national materials to meet nutrient requirements of poultry, swine, sheep, dairy and beef cattle, and if time permitted, we could dwell on some of these findings.

We stressed animal health. Losses from diseases were excessive and we helped to establish diagnostic services throughout the country.

We developed appropriate management technology, along with our Mexican colleagues, and we worked on dairy production in the tropics.

Our Mexican colleagues learned with us and we with them. Perhaps the greatest contribution that we made over the years is the number of young people who were trained, at both the technical and academic level, enabling them to understand the linkage between science and practice.

That core of Mexican scientists remain today at the heart of agricultural research and educational institutions. In their turn, those Mexican institutions not only are serving Mexico's needs, but also provide opportunities for learning for students and scientists from all over the world, and this must be recognized.

In many respects, the Mexican institutions have as great a sophistication as our own and their programs are relevant to farmer's problems. We believe that the same kind of partnership which addressed the urgent problems of yesterday can continue and can be used to address new areas of concern.

We feel that Mexico is capable of being a full partner with us in addressing scientific and development problems. A number of these key areas which still must be developed include the northern border States of Mexico: Chihuahua and Sonora and Nuevo Leon, with particular reference to arid and semiarid agriculture.

The Yucatan Peninsula has been an area of major concern to Mexico because of its traditional reliance on hennequin. The high rainfall tropical areas of the Gulf States of Mexico, including Veracruz and Tabasco, and the potential for year-round irrigated rice in those areas is enormous.

Further development of Mexico's Pacific coastal areas not yet under irrigation: These are only some of the areas requiring development.

Mexico's agricultural exports remain as a prime source of foreign exchange earnings and employment. The problems related to the trade of agricultural commodities are important to both nations since our exports of wheat, maize, milk products, and soybeans to Mexico are substantial.

Mr. Chairman, I would like to offer some general comments which bear on the future relations between the United States of North America and the United States of Mexico and the possibility of establishing cooperative programs of benefit to both nations.

I must say here, Mr. Chairman, that I have read the proceedings of the first meeting of this subcommittee of June 6. While I fully respect the opinions of economic analysis given by the various witnesses, I feel that the cold logic of economics has to be preceded by the creation of "un ambiente de amistad" built on true respect and admiration for what our neighbors are really like.

I fully agree with the Senator's comments this morning in that regard. Most people on both sides of the border attribute the historic change in Mexico-United States relations to Mexico's newly discovered oil resources and the United States newly acknowledged energy crisis. It is much more complex than that.

Although oil will account for a greater part of its industrial and material growth in the future, Mexico is much more than an oil power. It has an excellent social infrastructure, modern agriculture, industrial plants, highways, railroads, airports, schools, hospitals, social security, cultural centers, a stable government.

Obvious, too, are such spiritual things as integrity, responsibility, inspiration, dignity, and a fierce sense of loyalty to friends.

As you know, Mexico has changed dramatically during the last two or three decades, much more than OPEC nations. Mexico has many assets for which the OPEC nations must pay with their oil money.

Because of all of this, Mexico will be recognized as a great nation. It is imperative that the United States and its people recognize Mexico's new image. Mexico, now more than ever, is seeking its economic and political independence.

Some of the top people in Mexico believe that many of the problems leading to the degradation of United States-Mexican relations stem from a general lack of understanding of the many important issues involved.

I would agree with this and would add that the procedures and organizational machinery to address those issues is also lacking. The greatest weakness is not in the identification of problems but in the implementation of programs for their resolution.

There are a great number of United States-Mexican programs in both the public and private sectors as we have been hearing about this morning. For the most part, private sector initiatives seem to have been more successful for both countries than public ones.

In consideration of the world situation regarding energy and food shortages, Mexico, at the moment, appears in a privileged position, assured energy supplies and export earnings while in close proximity to U.S. food supplies.

While being in juxtaposition to U.S. food supplies, Mexico's agriculture could be especially vulnerable to distortions caused by excessive imports.

Finally, Mr. Chairman, I truly believe that for us in the United States, Mexico is the gateway to Latin America. Unless we become more aware, more concerned, more skilled and more active in embracing the ambitions of our neighbors, we shall lose a historic

opportunity to strengthen this hemisphere. In my opinion, I do not think we should let that happen, particularly by default.

Thank you very much.

Senator BAUCUS. Thank you very much, Dr. Pino.

Mr. Borlaug, it is a great honor to have you here. It is not often that we get a Nobel Prize winner to give us advice on what we should do and how to proceed, and we are happy to have you here.

Mr. BORLAUG. Thank you, Mr. Chairman. It is a real privilege and pleasure to be here.

The document that I have presented for inclusion in the record unfortunately I did not make enough copies—I came by air—so if everyone will bear with me, I will touch on the major points.

Senator BAUCUS. Do you have a copy we could include in the record?

Mr. BORLAUG. Yes.

## STATEMENT OF R. NORMAN BORLAUG, DIRECTOR, WHEAT PROGRAM, CENTRO INTERNACIONAL DE MEJORAMIENTO DE MAIZ Y TRIGO—CIMMYT

Mr. BORLAUG. I would like to touch briefly on some of the major developments that I think have evolved from the small, modest cooperative agriculture program of the Mexican Government and the Rockefeller Foundation.

It is an old program, yet most people do not know about its origin. It preceded all other foreign technical assistance programs in agriculture by at least 7 years. It was established in 1943 at the request of the Mexican Government.

This request came, curiously enough, through official government channels at the inauguration, or shortly thereafter, of President Manuel Avila Camacho, when Vice President Henry Wallace represented the U.S. Government at these ceremonies.

After the ceremonies, he was invited to visit the agricultural regions in parts of Mexico with the outgoing President Lázaro Cárdenas and with the incoming Secretary of Agriculture, the late Marte R. Gómez.

After a trip of several days looking at the agricultural problems and lack of trained people, a request was made to the U.S. Government to assist Mexico to train young Mexican scientists and to help establishing a viable, dynamic agricultural research program which would lay the ground work for increasing production of basic food crops.

When Vice President Wallace returned to the United States he pondered this invitation and decided to call the Rockefeller Foundation, because of their 25 years of experience in international programs with Ministries of Public Health in 26 different countries. He proposed that the Rockefeller Foundation look into the feasibility of establishing such a program. This was done and the program that Dr. Pino has mentioned was established in 1943.

I joined that group less than a year later and I have been there ever since. In the earlier period—the first 20 years—I worked exclusively with the Mexican-Rockefeller Foundation program. During the last 15 years I have worked in agricultural research and production in a much broader context in many developing nations around the world.

The impact of this first technical assistance program has had a tremendous influence in many countries around the world, and I would like to give some background on how this came about.

Before I do so let me mention briefly the magnitude of the food problem that lies ahead. Within the next 40 to 60 years, food production worldwide will have to be doubled. That is to say that we will have to increase production in the next 40 to 60 years—depending on how you assume and calculate population growth—as much again as was achieved from the beginning of agriculture some 12,000 years ago up to 1975. Unless this is done, Mr. Chairman, there will be social, economic, and political chaos in this world, no matter how much planning is done. This is a target that must be achieved.

Now, let's look at what was achieved from this very modest beginning in agricultural research in Mexico in 1943. The Mexican Government-Rockefeller Agricultural program preceded President Truman's point four proposal described in his State of the Nation address in 1949 by some 5 years. The point four program, which initiated foreign technical assistance to developing nations, came into being in 1950.

So the Mexican program was a pioneer agricultural program from which the pay-off has been very great.

The so-called green revolution in wheat production was spawned in Mexico by this program and was spread later to other countries in Asia, Africa, and Latin America. This "revolution" affected many crops but especially wheat, because it so happened that the Mexican wheat technology could be transplanted—with some modifications—around the world, and has had a tremendous impact on total food production.

The foundation program, in collaboration with the Government of Mexico, had a twofold purpose: to train scientists—young Mexicans—to improve their food production, and to establish a good network of viable agricultural experiment stations.

This was achieved by 1960, after some 800 young scientists had been trained at various levels. The responsibility of the Rockefeller staff all along the line was to work ourselves out of a job, not to see how long we could stay in a bureaucratic situation. Thus in 1960, the trained Mexican staff were transferred to the National Institute of Agricultural Research, a purely Mexican institution created that year.

In the period from 1943 to 1960, there were many requests for similar types of collaboration for assistance in agriculture by many developing nations. They came to the Rockefeller Foundation, which tried to meet several of these requests, but there were not enough funds. The Ford Foundation joined us, and one model international research center was established, the International Rice Research Institute—IRRI—in the Philippines.

Shortly after IRRI was opened in 1960, and only 2 or 3 months before the final farewell to the few of the Rockefeller Foundation staff that were still in Mexico, the late President Adolfo López Mateos offered a farewell dinner. All of his Cabinet members were present and many of the young scientists who had been trained.

As he rose to speak, he said:

I am confused by this departure. Just 2 months ago I visited Southeast Asia. Quite by chance, while I was in the Philippines I was taken to the International Rice Research Institute, a magnificent organization. I was told that this was modelled after the Mexican agricultural program—the Rockefeller Foundation-Mexican Government agricultural program—that we are saying goodbye tonight.

We know how much Mexico has benefited and since the model has been developed here, then I, as President of Mexico, strongly urge that my government and the two foundations look for some way to establish an international center for maize and wheat improvement in Mexico, so that we can help other third world nations.

Thus CIMMYT was initiated within 3 years. In 1963 it became a paper organization. It became viable, more or less, in 1967-68. Meanwhile, we worked in many other countries and the Mexican green revolution in wheat production spread to throughout world.

I will illustrate one case to provide a better comprehension of this work—the case of wheat production in India. We began to work in India briefly in 1963 with Indian Government research scientists and a small group from the Rockefeller Foundation.

At that time, India's total wheat production was 10.4 million metric tons compared to the 1979 harvest of 34.7 million metric tons. In other words, there has been an increase in annual production of 24 million metric tons. If you place a market value on this increase for only 1 year, it would represent a pay-off of about $3.5 billion. More important than dollars, India, which now is in the worst drought perhaps in the last 30 to 35 years, has sufficient wheat in storage to provide some protection against projected cereal shortfalls in 1980. Based on their own production—I should mention that rice production in the last 4 or 5 years also has gone up dramatically—India has a foodstock of 22 million tons stored in their warehouses, this was produced within their own country, and will serve them very well at the present time.

Were they to have tried to find those 24 million tons in the world market today, with the Soviet Union in trouble again, imagine what would happen to food prices around the world from the standpoint of the consumer. Worse yet, what would be the plight of the Indian population?

The agriculture of India has been transformed stemming from the small seeds that were originally developed in Mexico and which the late President López Mateos insisted should be spread to help other countries.

Similar transformations have occured in Pakistan, Turkey, Tunisia and many other countries. Today CIMMYT has trainees coming from all around the world to Mexico and especially the State of Sonora which during the months of March and April, is a mecca for wheat scientists from the United States, Canada, and indeed from around the world.

What, beyond this, has the Mexican Government done to contribute to the improvement of agriculture in the United States? There have been active joint agricultural campaigns conducted by the two governments. One of the first was the eradication of hoof and mouth disease in the 1940's and the 1950's. This was a fine example of international collaboration which was completely successful. Otherwise, the U.S. livestock industry would have suffered tremendous losses.

Then there was the Mediterranean fruit fly program based in Mexico, and again, through the joint collaboration of the two governments helped to protect the citrus industry of the U.S.A.

Currently, there is the joint program to eradicate the screw worm established to help protect the livestock industry in the United States. Although the fly had been eradicated in the U.S.A., it came back every year from the wintering sites in Mexico, thus the two governments have established a model laboratory, the first of its kind, for biological control of the fly. Many million of these flies are reared artificially each week. The males are sterilized with cobalt bombs and released. The female is not promiscuous; she mates only once. When she mates with a sterile male, there are no eggs, thus effecting biological control.

Another type of assistance less well known is the facilities the Government of Mexico makes available in the State of Sonora for the U.S. Department of Agriculture and all of the spring wheat States in the upper Midwest—the two Dakotas, Montana, Wisconsin, and Minnesota—as well as the Canadian Department of Agriculture.

These areas send all of their experimental materials of wheat and barley to Mexico each year. They are planted on a Mexican experiment station during the winter season. This work began in 1950 and has continued. Such research accelerates the breeding of new varieties in the United States and Canada, cutting the time required to develop new varieties in half.

This project was created after the disastrous wheat disease epidemics which spread across the United States and Canada in the early 1950's. At that time, land was made available by farmers in Mexico and the Mexican Government permitted the free movement of seed across the border, and for the return of the seed back to the United States and Canada.

These cooperative acts receive little recognition, yet they have done much for mutual understanding among scientists as well as making a tremendous contribution to the protection of agriculture within the three countries of North America.

Mexico also has sponsored nurseries to permit the same acceleration of research in cotton at the Iguala Experiment Station of the Mexican Ministry of Agriculture. This, too, has continued for 25 years or more.

We all know about the Irish who immigrated to the United States during the potato famine. The origin of this potato blight is in the high valleys of Mexico where we have one of our main research stations, and this was developed as a potato research center with the assistance of Dr. John Niederhauser of the Rockefeller Foundation-Mexican program. It has become a center for international testing of potatoes from around the world including American potatoes and Canadian potatoes. The new types are sent to Mexico for screening against the natural infection and this, too, has helped tremendously in the production of this crop.

Finally, you have mentioned, Mr. Chairman, the intergovernmental Mexican-American legislative committees. I think these are bringing about a better understanding and I have been pleased to see in the press yesterday that finally there seems to be better understanding between our two great Presidents.

I think the first two meetings of the two presidents were not fruitful for both countries. I feel we should recognize our common

problems and not become provincial again in looking at the broad picture of United States-Mexican relations.

We all need to accept that we are a part of an ever more interdependent world. We only have to look at our imports to realize this fully. As one example we have 15 different commodities that are essential to our industries of which we must import 80 to 100 percent of the total needed. I will mention a few of these commodities, to stress their importance: chromium, titanium, aluminum, florium, and mercury. Then there is another group of 12 of which we import from 40 to 80 percent of the quantity needed. These include zinc, silver, potassium, petroleum—and the petroleum situation is getting worse and worse, as all of the witnesses have mentioned.

We live in a new world. We don't have the self-sufficiency we enjoyed before World War II when we were reasonably self-sufficient within our borders.

The sooner the general public comes to recognize our position in the world—that trade is essential to our well-being and that we have to give and take with our important trading partners—the better off the world will be and especially the United States, Mexico, and Canada.

There is one item that I think is a very prickly and important one, and this is the unemployment in Mexico. This has resulted, as we all know, in large movements of Mexican workers into the United States seeking employment.

There is a shortage of farm labor in the Southwestern United States and in other areas, but it has become a prickly problem because we have not worked out a reasonable solution between out two governments. This will continue to cause problems. There are many here who, I am sure, think Mexico should solve this within her own boundaries. Perhaps she should, but she cannot do it overnight. President José López Portillo is well aware of the problem and has taken every measure to try to reduce population growth by effective and humane family planning, but there is a time lag which cannot be avoided.

When I first went to Mexico, in 1944, there were 18 million inhabitants. Today there are about 67 million, and this kind of population growth is very difficult to handle. About 45 percent of the population is rural, but the unemployment problem cannot be solved in the rural areas alone. There must be industrialization, and President López Portillo has inaugurated a vast program to accomplish this. Small industries are planned which will be partially financed from income from petroleum. There also are public works programs. But these projects will take time to bear fruit.

Meanwhile, we should understand that their problems are also our problems, and vice versa. But there are small groups that sometimes add to the frustrations and the misunderstandings between countries when dealing with these complex problems.

For example, one of the ways of expanding employment opportunities for rural people in Mexico is in the production of horticulture crops, which require considerable manual labor.

Mexico has developed a good winter vegetable area in Sonora, near the U.S. border, but always there are complaints from Florida tomato lobbyists, in particular, who want to curtail the trade al-

though the market only represents perhaps $150 million of exports each year. This export market is one way of expanding Mexican employment opportunities, while providing U.S. consumers with lower-cost and good quality winter vegetables.

Finally, I would like to point out that for many years the United States has been an exporter of fertilizer to Mexico. Within the next 5 to 10 years, we will become large importers of chemical nitrogen fertilizer from Mexico, without doubt. We no longer have the gas or petroleum with which to produce it cheaply and economically. We should look at this aspect too.

In general, I am very concerned about our foreign policy for all Latin America. If indeed we have a foreign policy, for the 36 years that I have been in Latin America, it has been a patchwork sort of thing. When there is a serious crisis, we take interest. But all of our attention, virtually, has been focused on Europe, the Far East, and now the Middle East. We have ignored to a large extent, the many Latin American countries to our south, starting with Mexico but continuing through to Argentina and Chile. We will see more and more trouble ahead unless we become cognizant of their difficult problems.

Senator BAUCUS. Thank you very much, Doctor, it was a very good statement.

You are absolutely correct, in my judgment, in many of your observations. We have neglected Latin America in the United States for years and we are beginning to pay the price, I think, for that neglect.

My view, though, is that finally many Americans are going to wake up and realize that you have to pay much more sensitive, constructive attention to Latin America than we have in the past.

Someone once said that necessity is the mother of invention. Another way to say the same thing is that it is human nature not to do anything until you have to do it. It is human nature to procrastinate, but I think we are beginning to see the error of our ways.

I was very impressed with one of your earlier statements that in the very next 40 to 60 years we are going to have to double our food production. That is, produce as much in the next 40 to 60 years as the world has produced in the last 12,000 years.

My question is, because that is a very stunning statement, what are the major impediments to that kind of an increase in food production as you see it in the world? Is it that we do not have the right varieties of commodities, the irrigation, the water? What is it?

As you sit back and look at the problem from distance and perspective, what, fundamentally, is the problem?

Mr. BORLAUG. This, of course, is a complex problem and one that, in order to develop it properly, would——

Senator BAUCUS. We only have 5 minutes, so if you could answer it in one paragraph.

Mr. BORLAUG. It will require, first of all, that most of the food-deficit countries in the world accelerate production. Yet many of their soils are infertile due to a mining process with traditional methods of production, which has removed nutrients returning

little to the soil from the standpoint of the plant refuse or from the standpoint of chemical fertilizer.

Senator BAUCUS. This is worldwide, or is this in developing countries, or what?

Mr. BORLAUG. Virtually everywhere.

Senator BAUCUS. America, too?

Mr. BORLAUG. Well, since World War II we have been putting back more and more. Of course, we did put animal wastes back into the soil before we got all tangled up in transport problems——

Senator BAUCUS. We have tired soil. What else?

Mr. BORLAUG. The Chinese have been the artisans in using all organic wastes—plant, animal, and human going back into the soil. But, even so, they recognized beginning in about 1960 that they had to go farther and use chemical fertilizers.

Now, today, of course, there is great outcry on the environmental front that these chemical fertilizers are doing everything that seems to be negative and they do not comprehend that, without proper use of the right kind of chemical fertilizers as well as other chemicals that are essential to increase in production, such weed killers——

Senator BAUCUS. The central problem, then, is the soil and inadequate fertilizer. Is there anything else?

Mr. BORLAUG. You have to replenish, but then you have to have improved varieties to utilize that change in soil fertility. You have to conserve the moisture, whether it comes in the form of rain or as irrigation water, and use if efficiently.

Then you have the problem of control of diseases and insects and weeds. When you fertilize depleted soil, all at once the weeds which were anemic and miserable, just like the wheat plant itself——

Senator BAUCUS. Are brought up, too.

Mr. BORLAUG. Yes, all at once the weeds become aggressive and those weeds will use that fertilizer and overtake the crop, so you have got a whole new game.

Senator BAUCUS. More weed killers?

Mr. BORLAUG. It does not necessarily have to be chemical. It can be mechanical rotations, but this will vary from country to country.

There also have to sound economic policies established by the national governments in these countries that will permit the adoption of the new technology once it is established. That has to be done in each nation or in each geographic region for the different crops. In the case of the export of the green revolution in wheat from Mexico to India, and many other countries, a certain adaptation was necessary to modify what was learned in Mexico, and there is a lag time between developing a technology and when it can begin to reach and benefit farmers. Agricultural research is still miserably underfunded. Some recent information on funding is provided in the document that I left. The total expenditures on research all kind worldwide was estimated at $150 billion in 1979. Agricultural research was $4.5 billion, about 3 percent. I might mention that expenditures on defense research was 25 percent, or in other words, $37.5 billion.

Now, of all agriculture research expenditures worldwide, only $220 million was spent in developing countries.

Senator BAUCUS. What structural changes can we make?

Mr. BORLAUG. There has been a significant one in the last 10 years, the International Agricultural Research Institute network. There are now 12 in operation.

Senator BAUCUS. So it works well?

Mr. BORLAUG. It is working better than any other vehicle we ever had before. It needs improvement, and it needs——

Senator BAUCUS. How should we improve it?

Mr. BORLOUG [continuing.] Vigilance. It needs vigilance first so that the scientists in these organizations, as in our own national organizations do not become bureaucrats and lackadaisical and drift. When you are at the cutting edge, where there is hunger and if you are the right person for the job, you will work carefully but with the full feeling of urgency about the food production challenges ahead. The danger is that these institutes will become bureaucratic and build a cocoon around themselves whereby they no longer feel the problem of food deficits.

These international institutes now receive $120 million from about 30 different governments and organizations around the world. At the present time, they are adequately funded, but inflation keeps chewing on them, too, like all the other institutions.

So the job is clear cut. What we have got to do is to continue to support international research. I mentioned that we will have to double the food production in the next 40 to 60 years. Most of that doubling will have to come from the developing nations and if we fail, there will be uprising of many kinds, first national and then spreading like a virus to international fronts.

It is very fine to dwell on human rights but these concepts have very little meaning to the masses of the people, when you have no food in your stomach, no shirt on your back, no roof over your head, when you have no job to gain your livelihood, when your children are not in school and when you have no medical care when you are ill. It is a wonderful goal to strive for, but let us not be deceived by the difficulties of trying to achieve this. We talk empty words.

Senator BAUCUS. Thank you very much, Doctor. I appreciate your testimony very much. I could go on for a long time this morning, but we just do not have the time.

I wanted to thank you, and if you have any additional statements which you want to submit, we would like to have those as well.

I appreciate it very much. Thank you

[The prepared statements of the preceding panel follow:]

PREPARED STATEMENT OF JOHN A. PINO, DIRECTOR FOR AGRICULTURAL SCIENCES, THE ROCKEFELLER FOUNDATION

Mr. Chairman, it is my understanding that the purpose of these hearings is "to focus public and Congressional attention on the current status of North American relations in the field of trade and other areas, and to encourage serious thinking—both within and outside of our government—about the future direction of these relations." I hope that my statement will be helpful to this committee in achieving that goal.

*The Rockefeller Foundation*

As members of the Senate may know, the Rockefeller foundation is a philanthropic organization. It has both grant-making and operational programs concerned with a number of the world's important issues, such as the population growth rate,

health problems related to the great neglected diseases and, of course, food and agriculture.

Rockefeller Foundation interest in food and agricultural programs date back to 1935 when grants were made to assist rural reconstruction in China. Training in agriculture and veterinary medicine was supported in both Latin America and Asia under the aegis of the Division of Natural Sciences, which later became the Division of Natural Sciences and Agriculture. Extensive explorations and discussions by Foundation staff and consultants led to the establishment in Mexico in 1943 of the first in-country agricultural program, with emphasis placed on the basic food crops (wheat, maize, beans, potatoes, vegetable crops) and food animal species. By 1955 a separate Foundation Division of Agriculture had been created (renamed Agricultural Sciences in 1959).

The success of the in-country programs in Mexico (1943-66), Colombia (1950-70), Chile (1955-68), and India (1956-76) led to the concept of "international centers" which could assist many nations simultaneously by generating new technology and training people. Recognizing the overwhelming importance of rice as a food crop, especially in populous Asia, the Foundation in 1960 joined with the Ford Foundation and the Government of the Philippines to create the International Rice Research Institute. Altogether the two Foundations established four international centers.

In 1968 the combined operating budgets of these centers totaled approximately $7 million. By this time the impact of the "green revolution," which grew out of the Mexico and Philippines programs, had attracted worldwide attention. But so had the enormity of the population problem; ominous "food gaps" were appearing as new nations struggled to cope with economic and political realities, and bilateral and multilateral efforts were failing to close the food gaps.

In 1969, at the invitation of the Foundation, key leaders of international banks, bilateral and multilateral assistance agencies, and foundations met a Bellagio to consider the food problem and to learn about the international centers. From that meeting emerged the Consultative Group on International Agricultural Research (CGIAR), of which the Foundation has ever since been an active member. In 1979 the CGIAR supported nine centers whose combined financial requirements totaled $103 million. The CGIAR projecton for 1980 amounts to $116 million for ten centers and related activities.

*The people of Mexico*

Mexico is basically an agrarian society with almost 40 percent of its population classified as agricultural. Although the relative percent of its agricultural population, with respect to the total, is declining, rural populations face some of the severest problems of employment, low income, and limited opportunity. Almost half (48 percent of Mexico's total population is under the age of 15 years, reflecting a growth rate of 3 percent per year. (See table I.)

TABLE I.—*Population data for Mexico*

Latest official estimate of population, 1978—66,944,000. (Source: "U.N. Population & Vital Statistics Report," April 1979).

| | 1976 | 1977 |
|---|---|---|
| Population | 61,196,00 | 63,266,000 |
| Agricultural population | 24,206,000 | 24,454,000 |
| Economically active population | 17,653,000 | 18,257,000 |
| In agriculture | 6,983,000 | 7,057,000 |
| Percent in agriculture | 39.6 | 38.7 |

Source: "FAO Production Yearbook, 1977," 1978

Percent of population under 15 years of age, 1970—48.

Annual rate of growth of population, 1976—3.3 percent. (Source: U.S. Bureau of Census. "World Population, 1977.")

*Population (1976)*

| | |
|---|---|
| 1 to 4 | 5,591,800 |
| 5 to 9 | 4,626,069 |
| 10 to 14 | 3,943,740 |
| Total | 14,161,609 |

Source: "U.N. Demographic Year, 1977" 1978.

*The land of Mexico*

At the time of the initiation of the Rockefeller Foundation agricultural program in Mexico, Mexico was a nation of approximately 24,000,000 people. There were 2,000,000 people in Mexico City. A primary concern of its leaders was the development of its agricultural lands in order to feed its growing population. Land reform and distribution (the ejido system) has been a cornerstone of Mexican political philosophy since the Revolution of 1910. With most of the country's lands having been distributed, a major effort now must be made to increase the productivity of its arable lands since expansion of cultivable areas can only take place at increasing costs. Rural populations, therefore, are forced to seek opportunities in urban areas causing increasingly serious problems for Mexico as well as the United States.

Mexico is a nation whose geography and ecology span the range of temperate and tropical environment. Agriculturally its land resources are classified as follows:

TABLE II.—*Land areas of Mexico (1976)*

| | *In thousand hectares*[1] |
|---|---|
| Total area | 202,206 |
| Land area | 197,255 |
| Arable and permanent crops (est.) | 27,790 |
| Permanent pasture (est.) | 66,700 |
| Forest and woodlands (est.) | 71,100 |
| Other land | 31,665 |
| Irrigated land | 4,816 |

[1] 2.5 acres = 1 hectate.

Source: *"FAO Production Yearbook, 1977." 1978.*

*Early beginnings*

When Elvin Stakman,[1] Paul Mangelsdorf, and Richard Bradfield first visited Mexico as consultants to the Rockefeller Foundation, they found an agriculture which was largely based on traditional farming methods, a research establishment which was inadequate to address critical production problems, and a marketing infrastructure which limited the movement of products from farm or market. Having a background based in science, the "three wise men" included that the only sure way to provide long-term solutions to Mexican agriculture was to invest in science and people. Out of their deliberations emerged what was later to become known as the strategy for the Conquest of Hunger. The key elements of that strategy, subsequently used to guide expansion of Foundation agricultural programs to other countries, included commitment and support on the part of the host country; a sharp program focus and defined goals; a highly professional field staff; and emphasis on training national scientists and building up the capability of indigenous institutions.

*Operational strategy*

From its beginning the cooperative program in Mexico was designed to meet Mexico's goals and the Foundation's staff were considered essentially as the resources of the Ministry of Agriculture. The program was launched in 1943, based on a simple agreement between the Government of Mexico and the Rockefeller Foundation which provided the legal basis for the residence of Foundation staff in Mexico, the importation of personal effects as well as scientific and field equipment. Mexico made available land for experimentation, and a budget for recruitment of Mexican staff, and together with Foundation staff and support funds, there was established the Office of Special Studies in the Ministry of Agriculture. Avila Camacho was then President of Mexico and Morte Gomex was the Minister of Agriculture.

[1] Stakman, E. C., R. Bradfield and P. C. Mangelsdorf, "Campaigns Against Hunger," The Belknap Press of Harvard University Press, Cambridge, Mass., 1967.

It was decided early to focus attention on Mexico's basic food crops. At that time production was falling behind domestic requirement, especially in corn and wheat. Although there were some rumblings in the U.S. about focusing on two important U.S. export crops, the Foundation was able to avoid serious criticism because of its growing image as a humanitarian institution. That quality was to distinguish Foundation efforts, among other things, throughout the years, and is one of the bases of the credibility which the Foundation enjoys.

The program focus on basic food crops never varied although in subsequent years programs in beans, potatoes, vegetable crops, sorghum, poultry, and livestock were added to the original programs in maize and wheat.

The commodity focus and emphasis on research were used primarily as vehicles to accomplish the broader task of training Mexican scientists and building institutional capability which would survive beyond the life of the cooperative program. Obviously, too, the impact of the research results on yields was of more immediate concern. It was apparent that if such goals were to be achieved, a long-range commitment was required. The phase-out occurred twenty years later.

*Training people*

In the firm belief that people make the difference, the foundation's scientists began recruiting young Mexican graduates from the several agricultural schools in Mexico. These young graduates, who had limited exposure to farming operations, soon found themselves working in the fields under the gentle but firm hands of Wellhausen, Borlaug, Niederhauser, and others. From among the most promising were selected candidates for graduate study and from among these would eventually come the leaders of the research centers, extension services, agricultural schools, and other government agencies. In all, about 280 Mexicans were provided with opportunities for advanced training, many of these at the Master's and Ph.D. level. The selection process was rigorous and each graduate returned to a ready position in which his training was immediately tempered by practical program responsibilities.

The quality of Mexican trained scientists has been of such a high level that they in turn have served in third country programs. One of these scientists, Dr. Ignacio Narvaez, received the highest decoration awarded by the country of Pakistan for his superb leadership in their wheat program.

## BUILDING INSTITUTIONS

Key to the continuity of effective programs capable of meeting national needs is the kind and quality of a nation's institutions. As the program of the Office of Special Studies expanded, linkages were established with the schools of agriculture, the regional research entities and the extension services. Their staffs too were strengthened by spinning off the Mexican staff who had gotten experience in the O.S.S. Today, the National Agricultural Research Insittute (INIA), the National Livestock Research Institute (INIP), the National School of Agriculture, a number of regional schools, such as the Instituto Tecnologico de Monterrey (ITESM), the Antonio Marro School and others have qualified scientists ready to participate professionally in cooperative programs in this hemisphere. The Postgraduate School at Chapingo has pioneered in developing approaches to assist small farmers. the Puebla Project has served a a model for other programs in and outside of Mexico, as well as a "laboratory" in which further research and training occur.

Recently, the ITESM inaugurated a specal program for training the Managers of Experimental Stations. Students will be admitted from other countries as well as from Mexico. At the Range Research Station, La Campana, in Chihuahua, a special training program for capacitation of livestock research and production specialists is being initiated cooperatively with the Winrock International Livestock Center of Arkansas and Universities of the southwestern U.S. These are but a few of the examples of institutional capability to be found in Mexico.

At a different level stands the International Maize and Wheat Improvement Center. It too grew out of the earlier cooperative Mexico-Rockefeller program and receives considerable support from Mexico to this day.

*Future areas of cooperation in agriculture*

Future collaborative efforts rest on a recognition and resolution of a number of important issues. These are:

1. The importance of demographic growth and the implications this has in terms of food requirements, job opportunities, growth in urban areas, migration, and so on.
2. The utilization of natural resources, including land, water, minerals and marine resources, and the rights of each nation to protect its resources for the national good.

3. The role of the respective nations in hemispheric affairs.

Official inter-nation programs can only succeed if they evolve within a framework of commonly accepted principles. There is little doubt that private sector programs and activities have succeeded better than public sector ones because they could more easily accommodate within a narrower framework of understanding than is possible at the international political level. Nevertheless, future programs, especially those to be funded bilaterally must have a more clearly defined mandate than we seem to have at present.

Once the mandate is clear, the next step is to reduce the general to specific doable projects and finally to structure them in such a way that selected individuals and institutions are charged with identifiable, achievable objectives. In the agricultural field, there have been a number of cooperative programs between the two countries, such as with cotton, the Mediterranean fruit fly, foot and mouth disease, Venezuelan equine encephalitis and screw worm. Some of these continue.

Others which might be considered are:

1. Expansion of the tick borne disease research program. There is a promising start in this field in the cooperative program between the University of Illinois and the Mexican Livestock Research Center.

2. Initiation of a comprehensive program for the development of arid and semi-arid regions of the United States-Mexican border states. There are excellent institutions on both sides of the border which can contribute significantly to such an effort. Some previous initiatives in this direction failed for lack of support. A program of such a vast area must be imaginative, of long duration, and adequately supported.

3. Development of low altitude tropical areas. Mexico has considerable area in the tropics suitable for livestock production, annual crops, and citrus. Many of these areas are marginally productive or remain to be developed. A recent report by a Foundation team exploring the rice production potential of Mexico estimated that by increasing yields and expanding the production areas, Mexico could add several million tons annually to its harvest of rice.

4. Encourage the free flow of students and scientists between selected institutions of both nations, expecially to strengthen basic research activity dealing with genetic improvement of crops, livestock diseases, plant protection, soil and water, food policy, rural sociology, and rural development.

The success of any of these programs will depend on how they are structured, how they are staffed, how they are financed, and how they are perceived by their respective governments. Any programs to be carried out in Mexico should have Mexican leadership and largely Mexican staff. Ideally, an internationally funded program would have an international quality in its management, staff, and program benefits; each to a more or lesser degree depending on the nature of the program.

Mexico and the United States have a substantial flow of agricultural commodities across our borders. There are obvious concerns on both sides of the border regarding the impact of this trade on domestic production. Mexico's agricultural exports remain as a prime source of foreign exchange earnings and employment. Problems related to the trade of agricultural commodities are important to both nations since our exports of wheat, maize, milk products, soybeans to Mexico are also substantial. The next few years will test our capacity and willingness to resolve such problems for the mutual benefit of both nations. While I have no specific solutions to offer, I do think that we must address the problems and potentials of trade in the framework of a broader time horizon and certainly in terms of broader issues affecting both nations. I believe, too, that there must be some forum established which enables farmers, traders and consumer to freely explore their mutual problems outside of the orbit of official negotiators.

Finally, I should like to suggest that the success of our relations with Mexico could be a bellwether for our improved relations with other nations of this hemisphere. Mexico is the gateway to Central and South America. In a way, it is the colossus of the north for most nations to the south of it. Mexico has great influence in the hemisphere. We are their neighbors and must be their friends, and friends must trust each other.

### Statement of Dr. Norman Borlaug

Mr. Chairman, Hon. Abraham Ribicoff, and Members of the Senate Finance Subcommittee on International Trade: At the outset, I will provide your committee with some insight into my background and experience. This experience has influenced, in part, my point of view on a number of important social, economic and political problems of the developing nations and my interpretation of how these issues impinge upon relations between the U.S.A. and the developing nations, and especially with that of our next-door neighbor to the south—Mexico.

My name is Norman E. Borlaug, I am a production-orientated agricultural research scientist. I was born and reared on a small Iowa farm, and studied forestry and agricultural sciences at the University of Minnesota.

As a farm youth, I experienced the disastrous impact of the economic depression of the 1930's on American agriculture and on the social fabric of our nation. These shocking experiences left a deep impression, and probably in large part, subsequently influenced my decision to seek a career in agricultural research and production in food-deficit developing nations.

I have lived and worked for the past 35 years, outside of the U.S.A., assisting developing nations improve their agricultural production. As part of my responsibilities, I have been involved in: (1) the training of large numbers of young agricultural scientists from many nations; (2) the development and implementation of interdisciplinary research programs involving plant breeding, agronomy, plant pathology, entomology and cereal technology designed to develop improved technological practices capable of increasing agricultural production when widely applied; (3) devising effective programs for the transfer of the new improved technological practices to farmers; and (4) serving as an adviser to political leaders, policy makers and planners on policies and procedures that are required to stimulate the adoption of the improved technology by farmers which in turn leads to increased food production.

*The history and evolution of foreign technical assistance programs designed to aid developing nations*

Most of the public, as well as the majority of the political leaders, in affluent countries, take food abundance for granted. The United States is blessed with a highly productive efficient agriculture capable of satisfying domestic needs, and, in addition, exporting large quantities of agricultural products, which in recent years have soared above the $25 billion mark, yet the general public has little comprehension of the importance of agriculture to the economy or of the complexities of agricultural production, which makes this abundance possible. They seem to believe, all too often, that food is "produced in the super-markets." They have little comprehension of the capital investments, managerial skills, sweat and risks that are involved in producing our food.

Nearly half of the total world population is engaged in food production, the vast majority at a subsistence level. The percentage of the total population engaged in agriculture varies greatly from country to country. In most of the developing African and Asian countries from 70 to 90 percent of the total population is engaged in agriculture, contrasted to approximately 3.8 percent of the population in the United States. Our neighbors Canada and Mexico currently have 5.9 and 38.7 percent, respectively, of their populations engaged in agriculture.

Considering current and anticipated population growth and improvements in per capita food consumption over the next several decades, present world food production must be doubled within the next 40 to 60 years. Unless this is equitably distributed, there will be increasing economic, social and political chaos that almost certainly will affect all nations irrespective of political ideologies and economic systems.

In order to double world food production within the next 40 to 60 years, it will be necessary to greatly increase yield and production in the developing nations where yields, by American standards, are still very low and stagnant. But there is a long gestation period from the time when a nation commits itself to improving its agriculture, until the impact on production is realized. It requires years of interdisciplinary research to develop appropriate technologies suitable for the important ecosystems within a country for each of the important crops and cropping systems. It requires dynamic extension programs to transer the new technologies from the experimental stations to the farmers fields. It also requires large capital investments in infrastructure as well as effective economic policies and reliable markets that will stimulate the adoption of the new technology by large numbers of farmers.

Over the past three decades, foreign technical assistance programs have been launched to assist developing nations to improve their agricultural production. Within the past 10 to 15 years, a number of countries such as Mexico, India, Pakistan, the Philippines, Turkey, Thailand and Tunisia have realized large increases in agricultural output as a result of these programs. Continuing dynamic research programs and expanded investments in agriculture by governments will be required over the next four decades if increases in world food production are to keep pace with demand.

*The Mexican Government-Rockefeller Foundation agricultural program—A pioneering effort to assist a developing nation to improve its agriculture*

The first foreign technical assistance program designed to assist a developing nation improve its agriculture—namely The Mexican Government-Rockefeller Foun-

dation Agricultural Program—was launched in 1943. This effort preceded by seven years the first United States Government Foreign Assistance Program for Developing Nations, which was perceived and outlined under so-called Point 4 of President Harry Truman's State of the Union Address on January 20th, 1949, and approved by Congress on February 5th, 1950.

I was privileged to have been selected to serve as one of the first Rockefeller staff scientists in Mexico, by Dr. J. G. Harrar, the first Director of the Mexican-Rockefeller Foundation Agricultural Program. I remained a member of this cooperative project, in charge of the wheat program, for 15 years, until 1960 when its mission was completed and the responsibilities for the continuation of the research and production program were transferred to the newly created National (Mexican) Institute of Agricultural Investigations, staffed largely with young scientists who had been trained in the aforementioned program. From 1960 up until July 1979 I served as Director of the Wheat, Barley and Triticale program for the International Maize and Wheat Improvement Center with responsibilities worldwide.

Largely, as result of the success of the Mexican-Rockefeller Foundation Agricultural Program during the 1940's and 1950's, many requests were made by governments of developing nations to the Rockfeller and Ford Foundations for financial and technical assistance to launch agricultural programs similar to the Mexican program. After assisting a number of developing countries to launch similar national agricultural research programs, it became apparent that it was beyond the financial capabilities of the two foundations to meet the growing number of requests for assistance.

Consequently, in 1960 a new approach was made by these two foundations, and with the assistance of the Government of the Philippines, the first international agricultural research institute was established—namely, the International Rice Research Institute (IRRI), in Los Baños, The Philippines. This institute was charged with developing rice research programs that would meet the needs of all developing nations. In 1964 the International Maize and Wheat Improvement Center (CIMMYT) was created with a worldwide mandate for assisting developing nations with maize and wheat research and production with financial support from the Government of Mexico, the Rockefeller Foundation, the Ford Foundation and USAID. Under pressure from governments of developing nations for technical assistance on other crops and livestock problems, the network of International Agricultural Research Institutes has been expanded to twelve centers dealing with the food crops and animal production problems most important to the diets of the world's food-needy people. Currently, the network of international agricultural research centers is sponsored by the Consultative Group on International Agricultural Research (CGIAR), which includes the World Bank, the Food and Agricultural Organization of the United Nations, the United Nations Development Program and agencies from over twenty other countries. During 1980, some 30 organizations and governments will donate approximately $120 million to CGIAR in support of the agricultural research being conducted at the 12 international centers.

The research work now being conducted on agricultural problems at the International Agricultural Research Institutes is meant to complement, not substitute, the research being conducted by the national programs in the developing nations. Officials of CGIAR consider that the research work of the International Agricultural Research Centers is highly important for economic development in the developing nations where the vast majority gain their livelihood from agriculture.

There may be some that feel that an expediture of $120 million annually on the international research network in support of national agricultural research programs is too large a sum of money. However, when one compares these expenditures with the general expenditures for all types of research worldwide, as is shown in the following table, it pales into a very modest expenditure considering its importance.

ESTIMATED 1979 EXPENDITURES FOR ALL TYPES OF RESEARCH WORLDWIDE (CGIAR DATA)

[In millions of dollars]

| | Dollar expenditure | Percentage of total research expenditure |
|---|---|---|
| Total expenditure on all research worldwide | $150,000 | 100 |
| Expenditure defense research | 37,500 | 25 |
| Basic research | 22,500 | 15 |
| Nonmilitary space, energy research, etc | 12,000 | 8 |
| Agriculture research | 4,500 | 3 |

ESTIMATED 1979 EXPENDITURES FOR ALL TYPES OF RESEARCH WORLDWIDE (CGIAR DATA)—Continued

[In millions of dollars]

| | Dollar expenditure | Percentage of total research expenditure |
|---|---|---|
| (a) Agriculture in developed nations | 4,280 | 2.85 |
| (b) Agriculture in developing nations | 220 | .15 |

*Direct and indirect effect of the Mexican-Rockefeller Foundation agricultural program on world agriculture*

The Mexican research program launched in the mid-1940's began to have a significant impact on agricultural production by the early 1950's. Its first major impact was made in wheat production, which more than quadrupled in the period 1950–1970. During the same period large increases in production were achieved in virtually all other basic crops. Moreover, once Mexico achieved self-sufficiency in most basic crops, it began, for the first time, to develop export crops in which it had comparative advantage, such as the winter vegetables and fruits for export primarily to the American and Canadian markets.

The impact of research and its application on Mexican agricultural production was so impressive that when cooperative program was being phased-out in 1960, the President of Mexico, Adolfo López Mateos, insisted that an international center for maize and wheat research be established in Mexico with financial support by the Government of Mexico. He stated that he hoped such as institute could be established in Mexico so that his country could provide research and training facilities which in part would repay for the benefits received from the Rockefeller Foundation and at the same time would be helpful in improving the agriculture of other food-deficit developing nations. The International Center for Maize and Wheat Improvement (CIMMYT) came into being in 1964, and was destined to play a key role in revolutionizing wheat production in many countries of the next decade.

The development in Mexico in the early 1960's, of the high yielding semidwarf wheat varieties, together with an appropriate production technology that permitted the expression of their high yield production resulted in enthusiastic adoption by farmers and produced a spectacular jump in yield per acre and in national production. This dramatic revolution in yield and production of wheat, which occurred in Mexico, was successfully transplanted to India, Pakistan, and Turkey in the mid 1960's and somewhat later to many other countries. The impact of the Mexican semidwarf varieties and the improved production technology revolutionized wheat production in these countries, just as it had done in Mexico. Wheat production in India and Pakistan has more than tripled since 1966, and Turkey's production has doubled in the same period. These dramatic increases in wheat yield and production, and somewhat later in rice by using high-yielding IRRI rice varieties and improved technology soon became known as the "Green Revolution."

During the past decade Mexico has exported thousands of tons of high-yielding wheat seed to more than 20 countries in Asia, Africa and the Americas, including the U.S.A.

Currently the semidwarf Mexican wheats or their derivatives are grown commercially in Guatemala, Ecuador, Colombia, Peru, Paraguay, Chile, Argentina, Brazil, Spain, Portugal, Italy, Morocco, Algeria, Tunisia, Egypt, Sudan, Kenya, Tanzania, Ethiopia, Zimbabwe, South Africa, Jordan, Syria, Iraq, Lebanon, Israel, Iran, Afghanistan, Pakistan, India, Bangladesh, People's Republic of China, South Korea, U.S.S.R., Canada and U.S.A.

Mexico, during the past 15 years also has assisted many other countries to improve their agriculture. As an example, there has been close cooperation and understanding between the governments of Mexico and the U.S.A. in many programs of mutual interest, including the following:

1. The eradication campaign in Mexico in the 1950's of the Foot and Mouth Disease of Livestock.

2. The Mediterranean Fruit Fly Control Program to prevent the spread of this pest to U.S.A.

3. The Joint U.S.A.-Mexican Eradication campaign against the Screw Worm of Livestock.

4. The Government of Mexico, since 1951, has provided researchers from the U.S.D.A., North Dakota, South Dakota, Minnesota, Montana and Wisconsin with breeding facilities in Sonora, for the growing offseason (winter) nurseries of wheat, barley and triticale. This cuts in half the years required by U.S. scientists to produce a new variety.

5. In times of emergency, such as in the 1950-54 period when serious epidemics of stem rust devastated the wheat-producing areas of the U.S.A. and Canada, land and facilities were made available in Mexico for a winter (offseason) multiplication of seed of the new American wheat varieties, which were urgently needed to provide protection to American wheat farmers.

6. Campaigns against the production and distribution of Narcotics, e.g. Heroin, marihuana, etc.

7. Establishment and development of the Mexican-American Inter-Governmental Legislative Committee—as a vehicle for amicably solving problems of mutual interest to the two countries.

*Continuing problems of mutual concern to Mexico and U.S.A.*

Over the past several decades there have been a number of problems that have had negative effects on relations between Mexico and the United States. One of the most serious points of contention was that related to Mexico's water rights (both volume and quality) on the Colorado River. Fortunately, this problem was solved to the mutual satisfaction of both countries during the past administration.

Two problems of importance to the two countries, however, remain unresolved, namely:

1. The problem of large numbers of undocumented Mexican laborers crossing the U.S. border in search of employment.

2. The continuing problems of trade restrictions between the two countries.

On the surface these two problems appear to be unrelated but in reality they are interconnected and impinge upon one another.

The problem of unemployed and undocumented Mexican workers crossing the U.S. border in search of work is a prickly and sensitive issue for both governments. There is no simple solution to this problem.

The Government of Mexico is confronted with a serious and worsening problem of unemployment. This is the consequence of explosive population growth over the past three decades. In 1944 Mexico's population was approximately 18 million; today it about 69 million and continues to increase at the rate of about 3 percent thereby adding about 2.1 million to the population each year. The government of President José Lopez Portillo is well aware of the seriousness of this problem and has:

1. Launched an energetic national program of family planning to slow population growth to manageable levels. However, even with success in this program, there will be a long lag time before the positive results of this effort becomes apparent, since Mexico's population is a young one with 46 percent of the total, 15 years or younger.

2. Announced plans to greatly expand the capital investment is small- and medium-scale, labor-intensive industries. This is being done to provide more opportunities for employment and is to be financed in a large part from income from petroleum. It will take several years to construct and bring these new industrial plants on stream. Meanwhile there will be no appreciable reduction in unemployment and large numbers of unemployed workers will continue to seek employment wherever it can be found.

3. Attempted to expand the production of labor-intensive export crops, such as winter vegetables and fruits and thereby provide more employment. This effort has been repeatedly frustrated by threats of a United States embargo on imports of winter vegetables, especially tomatoes, under the stimulus of a very effective Florida tomato producers lobby.

4. Expanded the public work programs which will provide more jobs, while at the same time improving the nation's infrastructure.

I am convinced that the present Government of Mexico is making a valiant and honest effort to cope with the unemployment problem. Its task is made more difficult by the public's reaction to recurring accounts in the press of abuses to which undocumented Mexican laborers have been subjected by unscrupulous employers in the U.S.A.

It is ironic that while a labor shortage exists in some parts of the U.S.A., and especially in the southwest agricultural sector, a serious problem of unemployment exists in Mexico. It is lamentable that some suitable agreement beneficial to both countries has not been found.

It is my personal belief that the unemployment problem in Mexico and the need for more laborers in the U.S.A. deserves the attention of the highest levels of both governments. This international problem must be solved amicably and promptly, or it will continue to fester and contribute to weakening relations between the two nations.

*Mexican-American trade*

I am a strong advocate of free trade between nations based on the concept of the comparative advantage in the production of goods. This maxim can provide the greatest benefit to consumers, and enhances international understanding.

It should be evident to every American that we live in an ever-more interdependent world. This has resulted from the necessity of all nations to increase their trade in order to obtain the commodities and goods necessary to keep their economies viable and growing.

For example, prior to World War II, the U.S.A. was self sufficient in almost all renewable minerals, including petroleum. Today we import from 80-100 percent of the following 15 minerals that are vital to our industries: strontium (100 percent), colombium (100 percent), mica (sheet—99 percent), cobalt (98 percent), manganese (98 percent), titanium (97 percent), chromium (91 percent), tantalium (88 percent), aluminum (ore and metal—88 percent), asbestos (87 percent), the platinum group (86 percent), tin (86 percent), fluorine (86 percent), mercury (82 percent), and bismuth (81 percent). Moreover, there is another group of 12 important minerals that we import in quantities ranging from 40 to 80 percent of our requirements. This group includes: nickel (73 percent), gold (69 percent), silver (68 percent), selenium (63 percent), zinc (61 percent), tungsten (60 percent), potassium (58 percent), cadmium (53 percent), antimony (46 percent), tellurium (47 percent), barium (40 percent), vanadium (40 percent), and petroleum (45 percent).

The list is growing rapidly. If we were denied the importation of these basic minerals, as we were petroleum during the 1973 OPEC embargo, what would happen to our industrial production? To unemployment? What, as an indirect consequence, would happen to social unrest? In effect, whose lifeboat would we, as a nation, attempt to crawl into to save ourselves? We are now part of a one-world community whether we like it or not. It is not 1930 but 1979, and the spaceship earth has shrunk.

Sometimes, however, I feel the U.S.A. is acting as a schizophrenic in trade policies with our Latin American neighbors. For example, in 1977 Mexico was our fifth largest buyer of American goods, with a value of $4.8 billion. During the same year Mexico ranked seventh as a supplier of imports to U.S.A. with a value of about $4.7 billion. Trade in agricultural products were represented only a small part of the total. Agricultural exports to Mexico were valued at $665 million whereas agricultural imports from Mexico were valued at $1.0 billion. During 1977 petroleum imports from Mexico were valued at $856 million, but are expected to increase to $2.6 billion in 1979.

It is incomprehensible to me that we continue to bicker and irritate our Mexican neighbors over threatening to shut out tomato imports of about $150 million. Meanwhile, we will rely more and more on Mexico as a source of petroleum and gas.

In the past the U.S.A. has exported both phosphatic and nitrogenous fertilizers to Mexico. In all probability, within the next decade the U.S.A. will become a large importer of nitrogenous fertilizer from Mexico.

But export trade to Mexico will also almost certainly expand greatly in the next five years. Much of it will be sophisticated equipment for the oil and petrochemical industry. There will, however, be increasing exports of corn, soybean and wheat to Mexico as the population growth and increased per capita consumption continue to outpace Mexico's ability to produce these commodities in the quantities required.

*American foreign policy toward Latin American countries*

In closing I feel I would neglect my responsibility as an involved American citizen if I did not express my concern for our neglect of an effective positive foreign policy toward the Latin American Republics.

It appears to me that throughout the 35 years that I have lived and worked in Latin America, I have seen our major foreign policy efforts directed toward Europe, the Middle East and Far East. Serious American foreign policy attention and efforts are directed toward individual countries in Latin America only when and where trouble breaks out. It appears to me there is no constructive continuing overall policy. The neglect has often fostered frustration and misunderstanding among our neighbors—all of the Latin American Republics. And while neglect reigns throughout the region, it becomes fertile ground for troublemakers.

Senator BAUCUS. Our final panel consists of Mr. Robert E. Naegele, president and chief executive of Dow Chemical and Mr. C. L. Morton, vice president, New Business Ventures, Services and Government Affairs, also associated with Dow Chemical.

Gentlemen I would like to thank you for your patience this morning. You have been here a long time. I hope you have learned something from the witnesses who preceded you. I know I have, and I want to thank you also for coming, in addition to waiting all this time.

STATEMENT OF ROBERT E. NAEGELE, PRESIDENT AND CHIEF EXECUTIVE OFFICER, DOW CHEMICAL OF CANADA, LTD.

Mr. NAEGELE. Thank you, and I would also like to thank you for the promotion. I am Robert Naegele, president and chief executive officer of Dow Chemical Canada, Ltd., not of Dow Chemical.

For nearly 4 years, I have had the privilege as a U.S. citizen of living and working in the dynamic country on our northern borders. I am honored to have been invited to share my thoughts and opinions.

Canada, in terms of per capita natural resources, is perhaps the wealthiest nation on earth. It is a vast country with a small population, a stable democratic government oriented to free enterprise with a reservoir of friendliness to, and respect for, its gigantic, ofttimes insensitive, neighbor to the south.

In testimony before this committee on June 6, 1979, Paul Oreffice, president and chief executive officer of our parent company, and my boss, by the way, cut to the heart of the matter by stating that the serious problem facing the United States is energy and proposed a North American Economic Union that would benefit Canada and Mexico as well as the United States.

This was quickly picked up by some U.S. spokesmen and the media, restated as a North American energy pool and transmitted to Canadian ears to mean the United States had the right to, and would magnanimously agree, to share the hydrocarbons and energy of Canada and Mexico.

The Canadian reaction, as you might imagine, was considerably less than enthusiastic.

Despite its wealth in per capita resources, Canada has many of the same problems as the United States. Unemployment in excess of 8 percent; an unfavorable balance of payments closer to $6 billion, rather than the $5 billion expressed by the honorable Senator from British Columbia, and most of that is with the United States; a weak dollar; unacceptable inflation; a plethora of social programs that are currently unaffordable; and a present small shortage of oil.

While this is true, there is a difference between the two countries. In my opinion, Canada has the opportunity and national will to solve its problems in the eighties and while I believe the United States has this opportunity, it has yet to demonstrate that it has any clearly defined program in place.

Mr. Oreffice pointed out that the United States has energy self-sufficiency in its grasp but suppresses almost all by catering to vocal minority cultists. Hopefully this committee, and others will change the course and direction of U.S. policy.

Now, to the heart of the matter as it relates to energy and trade between the United States and Canada. Canada is essentially self-sufficient in energy. It exports more hydrocarbon Btu's than it imports. It currently produces 3 trillion cubic feet of gas per year

and roughly exports one-third of its total production to the United States.

Canada's potential marketable gas reserves, as listed by the National Energy Board on Friday, would represent 50 years supply or 147 trillion cubic feet.

There are those in industry—and let me add, as an aside, industry usually knows more and is more accurate than government—who believe Canada has economically recoverable reserves of natural gas in excess of 1,000 trillion cubic feet.

Please refer to a talk dated June 20, 1979 given by Jack Gallagher, chairman of the board of Dome Petroleum, Ltd., which has been submitted. May I ask that this speech, and copies of all other speeches we are submitting, be made part of the record.

Senator BAUCUS. They will be included.

Mr. NAEGELE. Thank you.

Canada currently imports only 16 percent, not 30 percent, of its crude oil needs. However, it can become self-sufficient in oil supplies by the mid-eighties.

In fact, if you refer to the same talk by Mr. Gallagher and others, some believe production capabilities in Canada could match prerevolutionary Iran or better before the end of the eighties, or certainly by the next century.

All of this with only a negligible contribution from the vast Canadian tar sands and very little from the Beaufort Sea.

I am also submitting talks by Mr. Richards, president of Dome Petroleum, Ltd., in April 1979, on a "Blueprint For Canadian Oil Surplus" and "Oil Self-Sufficiency by the mid-eighties, an Achievable Goal for Canada," as well as talks by Mr. Mort and myself given on various occasions.

If even part of the foregoing that you will read is true, then Canada can and will become a much larger exporter of hydrocarbons with time. In fact, considerations are currently under study to increase those exports now.

Before you take any consolation in what I have said, please understand that the United States is not the only alternative to Alberta, British Columbia and/or Canada. Pipelines to eastern Canada replacing oil with natural gas there, and anywhere else in Canada, sale to Japan of LPG's and other upgraded energy and hydrocarbons may, at this point, be preferable to increased sales to the United States of straight natural gas. The same will be true when Canada becomes a large exporter of oil in the future and to emphasize that point, I submit one other thing for reference and it is just an excerpt from the newspaper. It is a statement by Mr. Clark, the Prime Minister.

The Prime Minister said the availability of energy in Canada was the country's ace in the hole. What distinguishes us from other industrial nations, such as Germany and Japan, is that our energy future depends on hard decisions today, where their's depends on hard deals every day for a future as long ahead as they can see.

Mr. Clark agreed economic recovery in the United States is important to Canada, but he said the country was not totally dependent on the States. We should not lose sight of the opportunity for Canada abroad. We are not a captive supplier or a client state. We are free to sell our goods and services anywhere.

I will submit that for you.

Senator BAUCUS. It will also be included in the record.

[The material referred to follows. Oral testimony continues on p. 162.]

[From the Globe and Mail, Sept. 28, 1979]

The Prime Minister said the availability of energy in Canada was the country's ace in the hole.

"What distinguishes us from other industrial nations (such as Germany and Japan) is that our energy future depends on hard decisions today, while theirs depends on hard deals every day for a future as long ahead as they can see."

Mr. Clark agreed economic recovery in the United States is important to Canada, but he said the country was not totally dependent on the States.

"We should not lose sight of . . . the opportunity for Canada abroad. We are not a captive supplier or a client state. We are free to sell our goods and services anywhere."

The Prime Minister also alluded to some of his earlier promises and plans for the Canadian economy. He spoke of a new spending control system within the Government, reducing the size of the civil service and privatizing Crown corporations.

Mr. Clark returned to Ottawa yesterday afternoon.

---

DOME PETROLEUM SUPPLY CONTRACT WITH CONSUMERS POWER

In 1971, Dome Petroleum entered into an agreement to supply natural gas liquids to Consumers Power for conversion into synthetic natural gas for a 15-year period from 1973 to 1988. In reliance on this take or pay contract, Dome built plant and pipeline facilities in Canada and entered into take or pay contracts for supply from producers of natural gas liquids in Western Canada. Deliveries to Consumers commenced in 1973 and built up to a level of 50,000 BPD in 1976 with Dome the supplier of 50 percent of this volume.

In 1973, the U.S. Government enacted the Emergency Petroleum Allocation Act which responded to the disruption in energy supplies caused by the Arab oil embargo by empowering the Federal Energy Agency to interfere with existing contracts to the extent required to allocate scarce energy supplies to the highest priority users. This Act had no initial adverse impact on Canadian suppliers of energy commodities such as Dome because the F.E.A. recognized the importance of these natural gas liquids supplies and continued to grant to Consumers Power a feedstock allocation of 50,000 BPD. During 1977, Consumers projected a short-term reduction in SNG requirements due to a combination of increased Michigan production, increased supply from interstate transmission companies, and restriction on end uses of natural gas. Under terms of the 1971 contract, Consumers reduced their take of natural gas liquids and agreed to compensate Dome if the product had to be distressed below the Consumers contract price. No compensation was required until 1978 when the worldwide surplus of natural gas liquids caused prices in alternate markets to decline sharply.

In September 1978 the Department of Energy reduced the Consumers Power feedstock allocation to 8,000 BPD and then, in May 1979, further reduced the allocation to zero. This action was taken under authority of the EPAA even though there was no evidence of a shortage of NGL's (in fact, ample evidence to the contrary) and no alternate users could be found who were not adequately being supplied. This action has suspended indefinitely Dome's rights to deliver and has excused Consumers from any obligation to compensate Dome. Dome has had no alternative but to seek other, more reliable markets for Canadian natural gas liquids. These liquids are a by-product of natural gas production which must be produced to avoid shutting in natural gas production and cannot physically or economically be stored for future sale. Alternate markets can be developed because the Iranian crisis has resulted in a stronger worldwide demand for energy products from secure sources such as Canada. In the meantime, inappropriate and unnecessary U.S. government interference in this major long term supply contract not only costs the U.S. this important source of energy but jeopardizes the viability and financability of future, highly capital intensive, projects to supply energy to the United States. A stable regulatory environment and investor confidence and necessary prerequisites for multi-billion dollar projects such as the Alaska Natural Gas Transportation System.

---

## A North American Common Market: A Realistic Option for Canada?

(By Clifford L. Mort, Vice President, New Business Ventures, Services and Government Affairs, Dow Chemical of Canada, Ltd.)

My first occasion to speak to John Crispo was when John called me one day several months ago at my office in Sarnia and asked if I would consider speaking at his conference. His first choice had been a western Canadian, or more specifically an Albertan, who was a fairly new entry into the chemical business. When he begged off, due to conflicting engagements, he suggested to John that they try and get an "Honest Eastern Canadian" to substitute. He also suggested that I might fit that bill. John commented that day that even if I did not accept his invitation to speak, he would still like to meet someone that a strong, outspoken westerner would classify as an "Honest Eastern Canadian"!!

Obviously, I accepted John's invitation, and did so for a variety of reasons—such as not resenting being second choice to a friend from the west, and being flattered by the classification of an "Honest Eastern Canadian". However, by far the most important reason for accepting the invitation was the strong views I have on the advantages to Canada of a North American common market for certain segments of our Canadian Industry.

On this panel I represent the chemical industry as part of the manufacturing industries of Canada. I also represent a company who is investing in excess of five hundred million dollars in a western petrochemical development and supporting, by take-or-pay contracts, the investment of an additional six hundred million dollars by others in the Alberta Petrochemical Development.

Therefore we feel we have a tremendous stake in the success of the petrochemical industry in Canada and, specifically, in the western Canadian petrochemical developments.

I personally headed up Dow's efforts to develop the Alberta Petrochemical Project for the last six years, and am very gratified to see the major new plants nearing completion. During this period I have spent a considerable portion of my time in Alberta and have considered myself more of a Calgary resident than an eastern Canadian. Possibly this exposure has had a major influence on my views on a North American common market.

I am sure many of you are aware of the general Alberta view that they are heavily subsidizing the eastern Canadian manufacturing establishment. One historic subsidy is prices they pay for the duty-protected eastern Canadian manufactured goods. In addition, they feel they are heavily subsidizing all eastern Canadians by accepting less than world prices for energy.

However, I think the biggest influence that Alberta has had on my personal views on a North American common market comes from the general business atmosphere in Calgary and Edmonton. Calgary, for example, refuses to recognize that any economic problems exist anywhere in the world. No mountain is too high for their businessmen to climb. They feel they have the technical and business expertise to compete anywhere in the world in their number one business enterprise—the oil and gas business. Clearly, some of this atmosphere existed in Toronto and Montreal in the fifties and sixties. I sense that this aggressive, entrepreneurial atmosphere has disappeared in eastern Canada.

The industry I represent should have some of the same feelings as the Calgary businessmen. However, in general, the petrochemical industry has developed the same malaise as much of the eastern Canadian manufacturing industries. We are very prone to continue to analyze our past and current problems and try to protect our future problems, without ever taking any bold, constructive steps to eliminate our problems. The chemical industry, and the petrochemical industry, has classified itself as the "Invisible Industry", because many of our products appear as unseen components in final consumer products—such as plastic parts in television sets and vinyl seating in automobiles. However, we are not an invisible industry in terms of the jobs we provide. We are not invisible in terms of the quality of jobs and opportunities for highly technically trained people. Moreover, the high value-added characteristic of our products and the substantial capital investment we have made are highly visible.

Our industry will have invested between two and a half and three billion dollars of new capital between the new Petrosar project and down-stream facilities in Sarnia, and in our new Alberta Project during the period from 1975 to 1980. Very few industries, including the much-publicized automotive industry, could claim capital investment in Canada any greater than the chemical industry.

Despite this total investment and the heavy new capital portion of it, I consider that when judged against national goals and objectives, the Canadian petrochemical

industry has been a failure. It is clearly an under-achiever relative to its potential and will continue to be so without drastically different trade conditions.

The chemical industry has consistently shown several hundred million dollars per year of trade deficit for the last few years in identified chemical product imports and exports. However, the actual trade deficit in chemicals and petrochemicals probably is well in excess of a billion dollars per year, with an estimated several hundred million dollars per year of chemicals and petrochemicals being imported in the form of finished products as part of an assembled item, such as a television set, refrigerator, automobile, etc. We have estimated that the market for ethylene derivatives is probably twice the size of that supplied by Canadian-manufactured materials. The majority of the imports would be in the form of plastics incorporated into finished products.

Therefore, while the industry is a failure in terms of achieving a goal of balanced trade, the cards to some degree, are stacked against it. The markets for plastics in refrigerators, for example, are about a third that of our U.S. competitors, because most of our Canadian refrigerators are manufactured outside the country. Similarly, the plastics markets in the television industry are almost non-existent for Canadian manufacturers versus our Japanese competitors because such a large portion of our television purchases are from foreign manufacturers.

The chemical and petrochemical industry is particularly sensitive to the cost of energy, which generally represents in the order of fifty percent of its total cost of manufacture, and up to ninety percent of its variable cost of manufacture. Therefore, for our industry to be a viable enterprise in Canada, energy costs must be no higher than energy costs to our world competitors. We believe a case can clearly be made for the benefits to the Canadian economy, of lower than world competitive energy costs for industries, particularly if their costs are highly sensitive to energy prices.

The second most important item in our costs are capital charges per unit of production. It is this area where we consistently have had severe difficulty in remaining competitive with our world competition. There are many reasons, such as higher plant construction costs due to climate, construction labour costs, high duty protected equipment costs, higher money costs, etc. However, by far the most important aspect in a capital intensive industry such as ours has been the size of plants required to be globally competitive.

For many of our basic petrochemicals, such as vinyl chloride monomer, a single world-scale plant can supply substantially more than the entire Canadian market requirement. Therefore, in building a new vinyl plant in Canada we face the problem of being forever noncompetitive from a size and capital cost-per-unit of production standpoint, or exporting a substantial portion of the output. We chose to face the latter problem in our new Alberta Project.

More often though, the net result of this plant-size, Canadian-market-size, capital-cost-per-unit-of-production equation has usually been for Canadian manufacturers to import growing quantities of products over a number of years until the Canadian market can absorb the majority of the output of a plant; then, to build a facility and then, to export a relatively small percentage of output for a period of years until the entire output is sold in the Canadian market. This solution has resulted in a very major negative balance of trade for petrochemicals.

With a very favourable energy resource position relative to our industrialized competitors, our industry's aim should be to reverse this role of being a major importer over a number of years and then a limited exporter for a few years, to one of being a major exporter on a continuing basis.

For certain basic petrochemicals we should be aiming, as a nation, to be exporting more than fifty percent of our production. With this kind of a production base, we then could afford to support our downstream customers, making them more viable and more capable of competing with their competitors throughout the world. However, none of this can be achieved without substantial lowering, or elimination, of the tariff barriers on these basic petrochemicals, particularly into the United States market. Lower than world energy cost in Canada cannot, by themselves, be expected to permit our industry to jump the present and potential future tariff barriers.

For example, Canadian petrochemical manufacturers would have to be assured of crude oil and energy costs at least three to four dollars per barrel lower than our U.S. competitors on an on-going, long-term basis, to construct facilities to produce product primarily aimed at duty protected export markets. It is impossible to foresee this kind of energy cost differential.

There has been some feeling that the current round of GATT negotiations will go a long way to resolve the market access problem for the petrochemical industry. Our analysis is that this is entirely false and the existing GATT round of negotiations will be a semi-disaster for the Canadian petrochemical industry.

We have carried out fairly extensive studies for certain basic petrochemicals, based on the current level of duty protection in the Canadian market versus economic access to the U.S. market. We have considered the same situation at fifty percent of today's tariffs and at zero tariffs in both directions.

The startling fact is that we have no economic access to these foreign petrochemical markets today with the existing tariff barriers. If tariffs are cut by fifty percent, and we lose half of our existing Canadian protection, we have only achieved economic access to one-half of one percent of the U.S. petrochemical market from producing plants in Edmonton, Sarnia and Montreal. However, if tariffs are completely eliminated, then certainly we have foregone even more tariff protection in the Canadian market, but, in the process, have obtained economic access to approximately fifty-six percent of the U.S. petrochemical market. Therefore, the tariff cuts that are currently being considered will simply give away Canadian protection without offering any economic access to U.S. markets. Canada has to be a loser on this deal.

Now let me summarize. I believe the petrochemical industry is a very basic, vital industry to this country. The products of our industry are used by virtually every other industry and every consumer in Canada. The economic strength of this industry will be felt by all other industries in this country. I doubt if any industry, other than the steel industry, can have the same basic impact on the economy as our industry.

The industry has the potential of producing goods for the Canadian market at economic prices to support down-stream industries to become more competitive in the Canadian market. It also has the economic potential (based on our fundamentally strong energy position) to become a major exporter of products to world markets. However, I believe it is difficult to see any of these great things happening unless the levels of tariffs into the U.S. market for petrochemicals are established substantially below the aim point of the current GATT negotiations.

Therefore, I am a strong supporter of a North American commen market for certain basic petrochemicals and believe that the Canadian petrochemical industry is, for the first time in its history, in shape to enter such an arrangement.

---

## Chemical Trade in the 1980's and Implications for Canada

(By Robert E. Naegele, President, Dow Chemical of Canada, Ltd.)

I am firmly convinced that Canada's petrochemical industry stands at the brink of a fantastic growth opportunity, particularly that part built on natural gas.

However, in the decade ahead it is entirely possible for this industry and the Canadian nation to blow this golden opportunity completely. That won't happen if this industry thinks and acts smart in the light of global economic and trading realities rather than purely domestic parochialism. Such a myopic scenario could have this industry waking up five or ten years from now to discover that the chemical producing world has passed Canada by in a race where catch-up will be well nigh impossible.

On the other hand, if we individually and as an industry work hard and realistically to take fullest advantage of Canada's unique and enviable energy resource position (particularly in natural gas), Canada can achieve major status among the trading nations of the world—with all the perks that go with it for every Canadian. We must continually press governments at both levels to recognize and encourage primary and downstream development of Canada's comparative advantage inherent in our growing natural gas energy self-sufficiency. Upgrading these resources here must prevail.

*Market expansion needed*

At the same time, we must also press our governments to aid our industry in gaining access to foreign markets for those Canadian-made petrochemicals that are based on our strong domestic natural gas energy position. This is the foundation for Canada's newfound comparative trading advantage. Indeed, this same trade development thrust should *also* be used to encourage expansion of those downstream finished product manufacturers who depend on assured domestic supplies of these same natural gas derived chemicals and plastics for their penetration of world markets.

*Generates jobs*

Given a chance here and abroad, the Canadian petrochemical industry can indeed generate new job opportunities the likes of which this country has never seen before. Such activity will inevitably improve productivity sufficient to justify significant wage increases without contributing to inflation and without rendering Canadi-

an-made goods non-competitive in export markets. If some politicians and businessmen could only recognize the potential staring them in the face, they would see that the tax base and income potential could be expanded justly and democratically so that this nation could finally afford the social welfare schemes already in place. Furthermore, there is every likelihood of a complete turn-around of our current merchandise trade imbalance in chemicals within a relatively few years.

*Toward a secure future*

Such an industrial development strategy would secure the future for thousands of small businesses, including those who make up the infrastructure so necessary to the development and maintenance of our industry. It would bring to this country and put to practical use the best of the high technology developed elsewhere so that Canadian R&D does not have to waste time, money and resources re-inventing the wheel because of nationalistic altruism. It would serve to re-direct Canadian R&D activity into areas where there are indeed good chances of commercial success because there would be a more viable and enlarged base to absorb such long term high risk activities.

To accomplish all this—and more—our industry and our governments must first recognize the immutability of the laws of physics, chemistry, economics, and international trade. Secondly, both must squarely face the realities of our internal resource base. All the rhetoric, regulatory interference, and misguided attempts to control these and the free market are unnecessary and futile in the long run.

*Canada unique*

For example, Canada is unique among the world's industrialized nations. It has more than enough accessible established reserves of natural gas right now to supply our fuel and aliphatic petrochemical needs for at least another three decades. And we know that activity in Alberta in the Deep Basin area alone could increase our supplies by enough for several more decades. If we add the potential of the Beaufort Sea and the High Arctic the additional gas reservoirs could extend our self-sufficiency well beyond the end of the next century.

Canada is not self-sufficient in petroleum and can have no international advantage in oil-based aromatic feed stocks. Nonetheless, such development is viable for Canadian internal demands even though it has no advantage over any other country that must import its oil. Hence we must exploit out strengths and avoid dilution of development effort. The mid-eastern situation will not go away. OPEC will continue to call the tune on oil prices and availabilities for many years to come. The reality ofthe Canadian situation is that industry built on that foundation will be unpredictable and insecure. Let's accept that fact and learn to live with it.

*Tariff reductions needed*

It is no secret that Canadian chemical producers haver no significant access to U.S. markets today with the existing tariff barriers, especially with product from less than optimum sized plants. If tariffs were cut both ways by 50 percent, we would lose half of our existing Canadian protection but would gain competitive access to only one-half of one percent of the U.S. petrochemical market from producing plants in Edmonton, Sarnia, and Montreal.

However, if tariffs were completely eliminated we would, of course, forgo all Canadian market protection but, in the process, we would gain an equal competitive footing in about 56 percent of the U.S. market. That is a five or six-fold market expansion, more than enough to support new world-scale petrochemical production units in Canada, particularly those based on natural gas. But here's the real clincher for Canada's trade negotiators: for the next decade or so, Canada's emerging world-scale chemical industry would not make more than about a 5 percent dent in the U.S. market for a selected range of basic chemicals.

Such a market expansion strategy *is* feasible if Canada's trade negotiators will demand duty-free entry of a limited range of aliphatic hydrocarbon chemicals for some small percentage of the natural gas export increases to the United States.

*Protectionist myths*

All the world's nationalist governments (and I use that term in the political protectionist sense), including Canada, more or less vaguely assign the following objectives to what they term their industrial strategies:

One. Pursuit of an industrial structure similar to that of the most developed and powerful model societies. For Canada, this unrealistic aspiration consists of trying to emulate the United States. It substitutes the maintenance of costly industrial diversification for the advantages of international specialization.

Two. It calls for the support of certain industries to the detriment of other and generally more profitable industries. Thus, it ignores the international law of com-

paritive advantage in favor of domestic political expediency. It perpetrates inefficiency and ignores real opportunity.

Three. It covertly encourages hostility toward multinational corporations headquartered in another country by falsely characterizing them as a cause of "backwardness", or uncontrollable extra-territorial influence—even though the fact is that this is most often generated by the policies of the host country itself.

Four. These nationalistic industrial strategies, again covertly, encourage perception of the free market system—competition and freedom of choice—as another source of backwardness and "foreign domination".

And Fifth. Such strategies invariably exhibit enthusiastic, yet naive adherence to the economic planning myth and to "national" theories of industrial development. The inevitable result of fertilizing the weak and pruning the strong is mediocrity, or worse, dominance by others.

*Freedoms are vital forces*

The truth is that the system that permits the consumer the freedom to choose between Gilles Vigneault and Peter Frampton, to read either Maclean's Magazine or Time, to buy Quebec rather than Canadian savings bonds, and to swim in a Muskoka lake rather than the Gulf off Florida symbolizes freedom and thus efficiency. It safeguards the supremacy of individuals, expands their choices, and lets them assume the costs of their personal options.

On the other hand, the protectionistic system that sets up obstacles to an individual's freedom of choice, that creates disincentives, that adds cost actually symbolizes oppression and supports inefficient use of the nations' resources.

Nationalistic protectionist moves are really instruments of coercion used by the strongest and best organized interest groups in order to transfer wealth to themselves by spreading that cost over the population as a whole. Contrary to the free-market-choice system, politically inspired protectionism is an instrument that stifles competition and is thus a source of oppression.

*Let's roll up our sleeves*

It is for these reasons that I believe we should stop deluding ourselves that small markets for all basic petrochemicals, and all the good things that can be made from them, are beautiful. The decade of the 80's, indeed the 90's, can (petrochemically speaking) be Canada's coming of age if we specialize along our lines of strength. Canada's opportunity is now. Let's roll up our entrepreneurial sleeves and make the most of it.

*Specialization is trade key*

Petrochemical specialization is where Canada's trading stengths are strongest, not diversification. We can never effectively compete in world markets by adopting the unrealistic aspiration of trying to reproduce in Canada the principal traits of the industrial structure in the United States.

If we play our cards right, we can evolve in the 80's into a potent international producer and marketer of aliphatic hydrocarbon chemicals and their derivatives and of all the finished goods produced from this group of petrochemicals. And we can do it without the need for protectionist nationalistic policies to prop up portions of our industry. Such subsidized industry really is a hidden "tax" imposed on the great mass of consumers and taxpayers by a minority of nationals who reap all the benefits.

*No future in protectionism*

We must fertilize the strong and prune the weak if necessary. It is our best route to an effective long term international competitive position. I am dead set against the proliferation of nationalistic protectionist policies. Nationalism as a value held by individuals is in no way reprehensible. Most of the time it is a commendable expression of attachment to one's relatives, customs, history, and destiny. But a virtue among individuals becomes an economic "vice" once nationalism is distorted within the political process. Distorted nationalism is otherwise known as protectionism.

In the free marketplace, individuals bear the costs of their decisions daily and therefore reveal their true preferences. But actions within the political process impose upon the total population the sometimes costly burden of choices that do not reflect the will of the people. The pursuit of personal or small group interests, most often disguised as "protectionism", all too often becomes the convenient foundation for political decision inspired by nationalistic ideology.

*Public exploited*

Governments therefore become the instruments for the exploitation of the general public to the specific benefit of narrow group interests. And the public accedes

because they are led to believe their welfare is being "protected". Politically, it's saleable. For the politician, the pursuit of personal goals is equivalent to maximizing the prospects of being elected or reelected.

Some examples. By restricting the quantity of imported shoes, garments, or TV programs—quotas, in other words—a government increases the price of these goods just as if an excise tax or duty had been imposed. But the "tax" actually goes to the domestic producer by permitting him to charge higher prices. Far too often this becomes a hidden subsidy paid by the mass of consumers in support of what is essentially a non-competitive enterprise or industry.

*Consumers pay more*

In a similar fashion, restrictions placed upon the import of capital, know-how, and technology ultimately generate higher domestic prices for the output of the sectors affected by eliminating or weakening outside competition. The very sad part of all this is that such restrictions hold down growth in a country's labour productivity. Indirectly, both consumers and workers pay the equivalent of a very regressive tax: not only must consumers pay more for the protected goods but they must also pay for them with a reduced budget.

SUMMARY OF A SPEECH BY

WILLIAM E. RICHARDS, PRESIDENT
DOME PETROLEUM LIMITED

TO THE

ATLANTIC PROVINCES ECONOMIC COUNCIL

APRIL, 1979

# BLUEPRINT FOR A CANADIAN OIL SURPLUS

One of the great misconceptions about the Canadian energy situation is the notion that Canada suffers a shortage of oil. The fact is that Canada has abundant supplies of oil - the amount of which will far exceed the technological usefulness of petroleum hydrocarbons as a fuel source.

What Canada suffers from is the under-utilization of its oil resources. We simply do not have the facilities in place to produce our oil. This is due primarily to circumstances which no longer prevail. In the past, much of Canada's oil was not economic to produce. With the radical change in world oil value, most of Canada's oil potential is now economic to produce. That fact, added to the new urgency created by the recent political instability of the traditional sources of much

of the world's oil, could lead to the creation of not only Canadian self sufficiency in oil but actually to a substantial surplus of supply.

Today I would like to discuss the means by which this can be achieved - why it should be achieved and the implications for the Atlantic region of its achievement. I have to add that this is not a forecast but rather a blueprint of how this objective can be achieved. Its accomplishment will be dependent entirely upon the existence of an appropriate economic and political environment and of the determination on the part of Canadians to seize upon the great opportunities with which we are presented.

In my view, these objectives can be achieved if full world pricing of Canada's petroleum hydrocarbons is allowed and if Government limits its disincentives such as royalty and tax to a reasonable level. Logic and common sense demand that we pursue such a course of action. It makes no sense whatsoever to pay world prices to foreign suppliers of crude who contribute nothing to the economy but the oil itself and deny equal pricing to domestic producers who contribute not only the oil but employment, taxes, revenue, security of supply and foreign exchange savings. Only time will tell whether logic and common sense will prevail.

I mentioned that Canada has a vast surplus of oil resources. Let us put the Canadian potential supply into perspective relative to Canadian needs.

Canada currently uses approximately two-thirds of a billion barrels of oil per year and this use is growing at less than 2% per year. Total demand to the year 2000 is forecast to be 17 billion barrels; total demand over the next 35 years is forecast to be 30 billion barrels.

The potential Canadian supply over this 35 year period is roughly made up of the following components:

Remaining recoverable conventional oil of 6 billion barrels.

Through high technology enhanced recovery, an additional 3 billion barrels of oil can be recovered through current reserves of conventional oil.

Additional conventional oil from the Western sedimentary basin - 7 billion barrels including 2 billion barrels of flowing heavy oil such as that found at Lloydminster;

Non-flowing heavy oil produced by In Situ projects such as those as Cold Lake and the Athabasca tar sands oil - 4 billion barrels;

Synthetic crude oil production from Athabasca oil sands mining projects - 11 billion barrels;

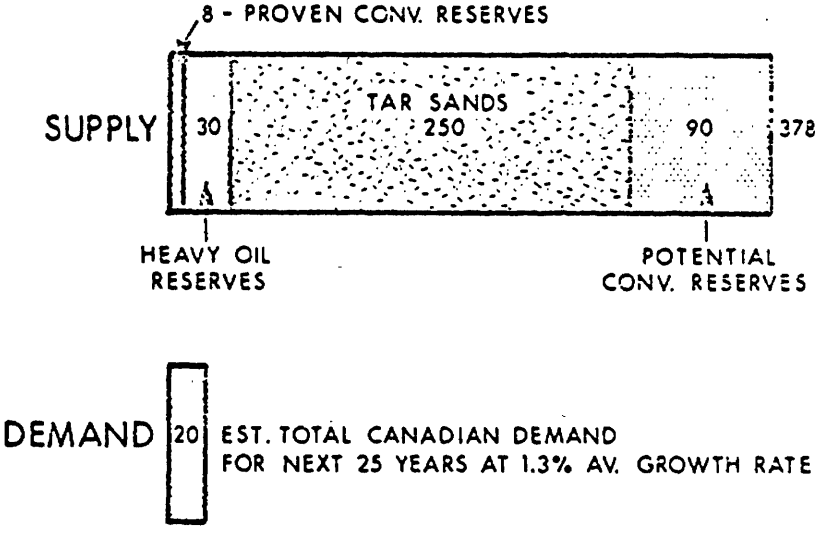
Pentanes plus from existing and new reserves - 2 billion barrels;

# CANADA

PROVEN AND POTENTIAL

## OIL SUPPLY AND DEMAND

BILLIONS OF BARRELS



Estimated reserves of frontier oil from the Arctic - 20 billion barrels;

Total estimated potential Canadian oil - 53 billion barrels.

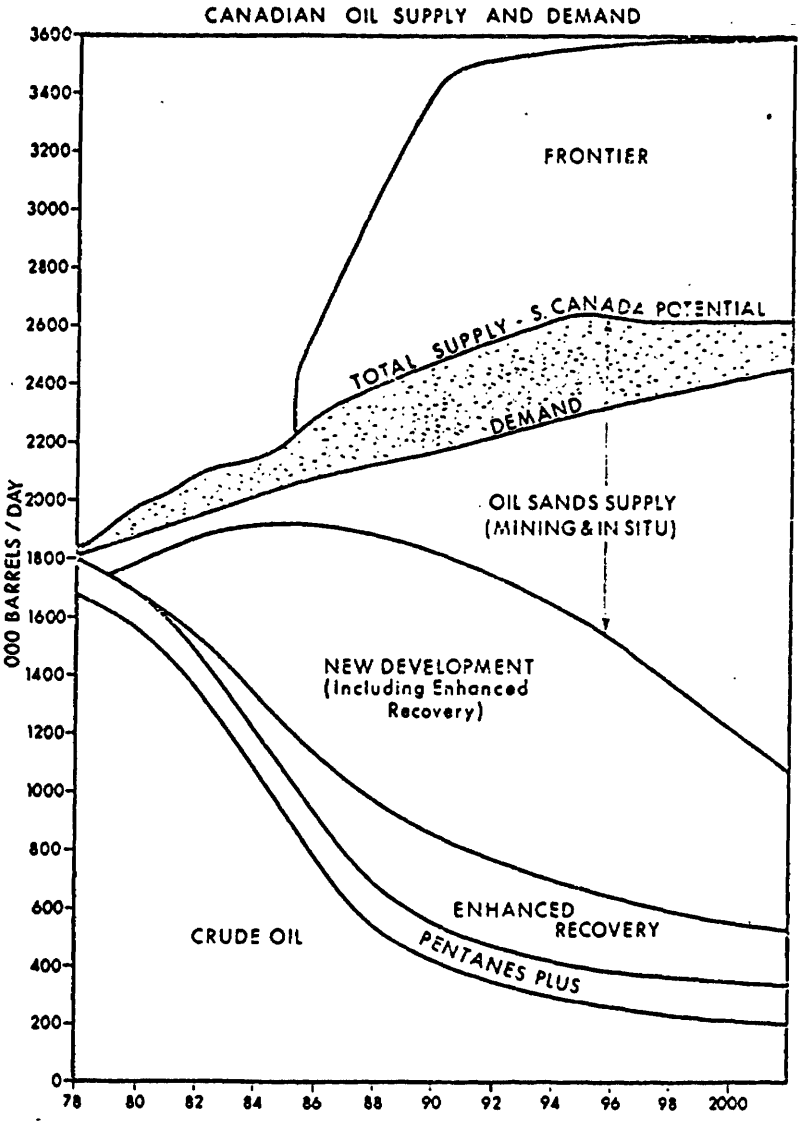
Ultimate Canadian supply of oil, that is including the period beyond the next 35 years, is 378 billion barrels.

This compares with our current useage of approximately 0.7 billion barrels a year and a 35 year requirement of 30 billion barrels.

To bring these vast resources on stream will require the expenditure of an enormous amount of capital. In fact the main limiting factor to the exploitation of these resources will be the capability of the Canadian economy to supply the labour, facilities and financing to accomplish this objective - but with a work force which suffers from substantial unemployment and an economy which is largely stagnated, this is a problem we should welcome.

Let us then examine the specifics of how we can achieve a Canadian oil surplus.

Today Canada uses about 1.8 million barrels of oil per day. Production capacity amounts to about 1.84 million barrels a day.


CANADIAN OIL SUPPLY AND DEMAND
000 BARRELS / DAY
3600
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
78
80
82
84
86
88
90
92
94
96
98
2000
FRONTIER
TOTAL SUPPLY - S. CANADA POTENTIAL
DEMAND
OIL SANDS SUPPLY
(MINING & IN SITU)
NEW DEVELOPMENT
(Including Enhanced
Recovery)
ENHANCED
RECOVERY
CRUDE OIL
PENTANES PLUS

However, the producing rate of Canada's conventional crude is expected to decline at the rather precipitous rate of about 100,000 barrels a day per year in the 1980's. That combined with a market growth of about 30,000 barrels a day per year means that we must increase our capacity to produce oil by a total of 130,000 barrels a day per year to maintain a balance between our production capacity and our consumption.

By increasing the remaining recoverable conventional oil from the current average of 29% of the oil in place to approximately 35% through enhanced recovery methods such as miscible floods, we can add approximately 300,000 barrels a day of oil production by the early 90's. This objective is well within the capability of current technology.

Condensate is produced in association with the production of natural gas. As gas fields mature and because much of the gas recently brought on stream has tended to be low in condensate production, condensate has been declining as a percentage of gas produced. However if we assume an increase in gas production due to exports of gas, condensate can be expected to be held constant in absolute terms at about 140,000 barrels a day, versus recent production of some 120,000 barrels a day.

In the area of conventional crude exploration, a revolutionary occurrence is taking place. For many years conventional crude oil discoveries have been on the decline. Expectations of significant additional supplies being added to the Canadian reserves have not been great. However, new important improvements in exploration technology have led to substantial new oil discoveries such as in the West Pembina area. Furthermore, as a result of the recent high level of exploration for natural gas, a large number of smaller accumulations of oil have been discovered. If we assume that gas exports are allowed, we can confidently assume that exploration will remain at the recent historically high level and that additional oil will continue to be found. We expect that much of this additional oil will from the start be produced in a manner to give the full benefits of the latest technology for enhanced oil recovery.

We expect that over the next 35 years, 10 to 15 billion barrels of conventional oil will be found in the Western sedimentary basin and that with full enhanced recovery 1.0 million barrels of oil per day could be added to the production rate.

Although the reserves of flowing heavy oil such as is found in the Lloydminster area are great, the production

rate per well is very low. Wells in this region under primary production conditions produce in the range of 10 to 30 barrels a day with an expected average recovery of only 5% of the oil in place in the reservoir. Under high technology enhanced recovery techniques the expected recovery of oil from these reservoirs can be increased by three or four times to recover 20% or more of the oil in place in the reservoirs. Of necessity the contribution from new additions of this type of production will be slow but will steadily rise to 200,000 barrels a day per year.

Of course the largest proved reserve of oil in Canada is to be found in the heavy oil reserves of Cold Lake and the Athabasca tar sands. Although these reserves are large they require an equally large investment to achieve their utilization. For example, a 150,000 barrel a day tar sands plant costs approximately $6 billion. Perhaps more important, however, these plants take a long time to build and it is probably beyond the capacity of the Canadian economy to have more than one plant under field construction at a time. Tar sands plants take about six years to complete of which approximately three years consists of construction in the field. We assume that two tar sands plants are planned at a time with one being completed three years after the other. In this way there will be only one plant in the field construction stage at a time. Thus one tar sands plant will

be coming on stream every three years at a rate of 150,000 barrels per day thus increasing Canada's supply of oil at a rate of about 50,000 barrels of oil per day per year. Over time it should be possible to improve on this rate of construction by decreasing completion time from six to four years but for my calculations I have assumed no such improvement.

As to the economic viability of tar sands plants, I feel the fact that the Province of Ontario was able recently to sell its 10% interest in the Syncrude plant at a profit of about one-third of its original cost demonstrates the economic viability of tar sands plants.

Imperial Oil Limited's huff and puff flood at Cold Lake is proving to be a great success. This type of project can produce about 125,000 to 150,000 barrels per day and we can confidently assume one new facility could come on stream every five years thus increasing the Canadian supply of oil at an annual rate of approximately 25,000 barrels of oil per day per year.

I have not included in this discussion any new oil supplies that will surely come from pilot development projects already under way in such huge accumulations as the Peace River and Wabiscaw heavy oil deposits.

Ignoring the important areas just mentioned, we have so far described how approximately 150,000 to 200,000 barrels per day per year can be added to the Canadian oil production rate over the next 35 years compared with the required 130,000 barrels per day per year needed to cover decline in existing conventional crude plus market growth.

We turn now to frontier areas and especially to the Canadian Arctic. We have estimated, based upon the cubic miles of sediment in the region, that the Arctic potential should be about 60 to 70 billion barrels of oil. To date every well drilled by our Company in the Beaufort Sea has yielded indications of petroleum hydrocarbons. The structures are enormous and the presence of porous reservoir rocks has been demonstrated. Thus we have the potential for the discovery of large reserves capable of production at high rates.

Assuming the tests of our wells in the Beaufort Sea are successful during this coming summer, we would hope to have oil on stream by as early as 1984, say at a rate of 200,000 barrels a day. Within a few years, total production from the Canadian Arctic could rise to 800,000 barrels to one million barrels a day.

This then is how we can achieve a surplus of oil production in Canada. There are those who would question why

we should do this, reasoning that these reserves should be kept for posterity.

This argument has a number of flaws - recent history has shown that our shortfall of oil production has been a result of not having in place the facilities to produce. Today for the first time in the history of our industry we have the opportunity to develop all those reserves on a sound economic basis.

The best way to ensure future Canadian supplies is to exploit our oil resources now when we have the opportunity. It is an opportunity which may never recur.

We cannot assume that these resources will always be instantly available. In most cases these developments require new or emerging technologies. For example, Arctic oil will require development of a new type of Arctic class tanker and new-design production facilities. Similarly, each succeeding tar sands plant represents an improvement over its predecessor. These developments take time and the Canadian economy can benefit through the sharing of the cost of the development of new technology with export sales. In fact in some cases the scale of operations will be so large as to require the contribution of both the Canadian and export markets.

Petroleum hydrocarbons as a primary source of energy may well be replaced within say 50 to 100 years by technologically more advanced energy sources. Let us therefore exploit this resource while it is still a resource rather than wait until oil and gas is no longer an important energy supply.

Add to that the fact that the exploitation of our oil and gas will provide economic growth and prosperity. Since these resources are owned by the public they produce substantial public revenue in the form of royalty as well as tax. This contribution will substantially reduce the burden of taxation on the rest of us.

Perhaps you may be wondering - what relevance does this have to the Atlantic Provinces. First of all - all Canadians must share an interest in Canada achieving the goal of an oil surplus - this is of particular importance to the Atlantic Provinces depending as they do on foreign oil to feed their refineries. The prospect of Canadian Arctic oil being transported to Saint John by 1984 in tankers built in Saint John must be of interest to this community.

Beyond that, you will have noted that most of these projects I have described for the achievement of a Canadian

oil surplus involve large capital expenditures. Let us add up the required capital expenditures over the next twelve years expressed in inflated dollars:

| | $ Billion |
|---|---|
| - for exploration and development - conventional oil | 55 |
| - for conventional oil through enhanced recovery | 16 |
| - for gas plants to produce the condensate | 2 |
| - for flowing heavy oil upgrading plants | 10 |
| - for In Situ tar sands plants | 12 |
| - for surface mined tar sands plants | 15 |
| - for Arctic oil production facilities and tankers | 25 |
| Total:- | 135 |

Much of this equipment and material will be supplied from all parts of Canada. For example, much of the steel, pipe and equipment can come from Ontario and Quebec. Already our Company has ships under construction and modification in three shipyards in Canada at an estimated cost of $60 million. In fact one is under construction here in Saint John.

The Atlantic Provinces will have a special role to play in the program for exploiting Arctic reserves.

One of the problems associated with the exploitation of Arctic reserves is obviously the harsh environmental conditions which greatly inflate the cost of construction on the site.

The vessel our Company currently has under construction here in Saint John is one of the most advanced design icebreakers in the world. With this vessel, augmented by a very substantial research program, it is our intention to develop the technology for moving throughout the Arctic region by ship at all times of the year.

This will enable a large amount of the construction of facilities for Beaufort Sea production to be carried out in the moderate climate of southern Canada because it will be possible to mount these facilities on barges and move them to the site ready to operate, representing an important extension of the module technology applied at Prudhoe Bay.

This will assist in saving much of the cost associated with on-site construction and will also prevent the dislocation of the environment that results from establishing large construction work forces in the Arctic.

We will take advantage of the infrastructure already in place in southern Canada rather than pay the high costs in

money, ecological damage, and adverse social impact that would result from establishing new infrastructures for large scale on-site construction in the Arctic.

Since the Northwest Passage from east to west is by far the easiest route to the Beaufort Sea, it follows that the Atlantic Provinces including Quebec will have a natural advantage in the fabrication of this equipment. In addition, many of the ships used to move the petroleum hydrocarbons from this region will be built in those Provinces.

The development of Canadian oil has great significance to the future fuel supplies of the Atlantic region. As we all know, the refineries in the Atlantic region are in varying degrees dependent upon offshore sources of oil. In fact there is currently a scheme for the construction of a natural gas pipeline to New Brunswick and Nova Scotia to supply gas to this region to decrease its dependency on imported oil. Unfortunately this project would be costly and requires a substantial subsidy to enable its construction.

The rationale for a Maritime pipeline is presumably to replace offshore crude oil. Unfortunately the completion

of this pipeline would likely coincide with the arrival of the first shipmemt of Canadian Arctic oil to the Atlantic Provinces.

Of course, construction of such a gas pipeline is entirely feasible but I think before we undertake its construction, we should examine the cost. Two alternate methods of subsidy are comtemplated. One would involve a straight assistance to the capital cost of the line. The other proposes the piggybacking of gas for Canadian use to an export line.

In the latter case the cost of transporting gas to the United States would be much higher than from alternate sources. This gas would have to be brought all across Canada through pipelines of descending size into this market at a cost substantially higher than what it would cost to take the gas to the closest point of export.

No matter what subsidy system is employed the dead weight cost of this project over the first ten years is about $125 million a year. Unfortunately we could displace only an average of five million barrels a year of crude oil during the first ten years. This represents only about 5% of the crude oil imported into the Maritimes during this period and therefore makes a small contribution to security of supply at a cost that exceeds the value of the crude oil displaced.

A more dramatic way of describing the subsidy would be to point out that the subsidy itself is equal to:

- 70¢ per gallon of crude oil; or
- about twice the value of the gas at the Alberta border; or
- is considerably greater than the value of the gas delivered to Toronto or Montreal.

Canada has a number of natural disadvantages such as climate and geography. We must ask ourselves how much dead weight economic cost we can assume. Each undertaking of this sort which imposes a burden on the public at large must be reflected in a reduced standard of living. If such an undertaking is deemed to be necessary to the achievement of essential national goals, we should not shirk from assuming the burden of its cost.

I have difficluty in believing that the replacement of Canadian oil transported in vessels built in Canada with Canadian natural gas should be one such goal.

A program for the development of a Canadian oil surplus is one of enormous potential benefit to Canada. For example, the potential rate of crude oil production of 3.5 million barrels a day in 1990 would be worth $48 billion per

year and would produce some $25 billion in Government revenue and provide direct and indirect employment to tens of thousands of people. Achievement of this goal requires recognition that an economically healthy exploration and production industry is essential. The health of that industry depends upon its being able to market its products including its surpluses to export.

The prospect of a shortfall in oil supply in the past was due entirely to under-utilization of our resources. The great need today is to find the oil and install the production and transportation faciltiies at a time when conditions will allow us to do so.

In this way we will contribute greatly to Canadian economic well-being at the same time as we are assuring the availability of petroleum hydrocarbons to meet our future needs.

In the past the oil and gas business has been viewed with some justification as being largely an Alberta concern. With the shift in emphasis in our industry to the geographical and technological frontiers of the Arctic, the tar sands, and high technology enhanced recovery projects, the impact of our industry will be more evenly spread throughout Canada. These new ventures are more in the nature

of manufacturing operations than were traditional oil and gas activities. The manufacturers of steel, machinery, ships and a wide variety of sophisticated equipment from all parts of Canada will become the major beneficiaries of these activities.

We should all realize that the Canadian oil and gas industry has become an important positive factor to the entire Canadian economy.

SUMMARY OF A SPEECH BY

WILLIAM E. RICHARDS, PRESIDENT
DOME PETROLEUM LIMITED

TO THE

CANADIAN BAR ASSOCIATION

AUGUST, 1979

The western world is faced with an energy crisis which can be described as the most serious threat to our society since World War II. This crisis is created primarily by the impending shortage of petroleum hydrocarbons throughout the world and especially because of the West's growing dependence upon oil from the politically volatile Middle East.

The United States is dependent upon imported sources of oil for one half of its total supply. With the rapid escalation of middle east crude oil prices the whole United States' economy is significantly influenced by each change in oil price dictated by the OPEC nations and the spectre of interruption of supply is a constant threat. It would appear that the United States does not have the capability of solving its oil problems from sources within its own boundaries nor can it expect to resolve its energy problem from other conventional sources. The recently published "Energy Future", the report of The Energy Project, at the Harvard Business School, states "These energy sources - domestic oil and gas, coal and nuclear power - as a group can increase their contribution to cover at most one-third to one-half of the nations additional energy needs over the next decade.".

The seriousness of this problem was recently commented upon by the former Secretary of Energy, James Schlesinger, who is reported to have stated that the United States is faced with a crisis resulting from this dependency which "threatens the political survival of the United States and her allies and quite possibly of freedom itself". I believe the Secretary is guilty of no exaggeration.

Although to a degree we in Canada share this problem we should consider the ways in which the Canadian situation differs from that of the majority of the western nations and in particular, the substantial opportunity we have to solve our oil supply problem and to contribute to the solution of this problem for other western nations.

While it is true that our ability in Canada to produce crude oil is currently in a precarious state of balance with our total consumption, it is generally recognized that given the continuation of present conditions our producibility from currently proved crude oil reserves is expected to decline at a precipitous rate commencing almost immediately. The National Energy Board, in its most recent report on crude oil supply in Canada, forecast that under present conditions Canada's oil supplies will decline at a rate of approximately 100,000 barrels a day per year during the 1980's out of total 1978 productive capacity of 1.8 million barrels a day. This, when combined with the NEB's projected increase in use of 25,000 barrels a day per year over this period will result in a deficiency in our crude oil trade account of approximately eleven billion dollars per year in 1985 and seventeen billion dollars a year by 1990.

Energy, particularly in the form of petroleum hydrocarbons, has in recent history formed an important part of the economies of industrialized nations. For example in 1972 petroleum hydrocarbons produced in Canada constituted about 2% of our total gross national product. Since that

time, however, the value of oil and gas as measured by international prices has increased almost ten-fold and in real terms probably at least five times, and the value of oil and gas measured by world standards now represents over 8% of the gross national product. In other words, oil and gas is now four times as important to our economy at it was seven years ago.

Countries with no oil and gas, such as Japan, are faced with an enormous outflow of payments for the purchase of this essential fuel which drastically affects their economies and their balance of payments. Those countries with indigenous sources of oil and gas enjoy a corresponding advantage. Countries which are self sufficient in oil and gas supplies are essentially insulated from the impact of rising oil prices. If prices go up, the higher price is held within the country's own economy and results in a redistribution of revenue within the economy. If a nation is dependent upon imported energy it is faced, as prices rise, with a massive outflow of funds. The wealth of the Middle East countries is achieved at the expense of the importing nations. As a result there is occurring today an enormous redistribution of wealth throughout the world.

Paradoxically, viewed from a completely selfish point of view, the energy crisis offers Canada an unparallelled opportunity. In 1973 most of Canada's oil could not compete with the $2.00 per barrel Middle East oil. Today, with prices ranging anywhere from twenty to forty dollars a barrel, most, if not all, of Canada's potential reserves are economic to produce. And these reserves are sufficient to supply all of Canada's foreseeable needs with a substantial surplus for sale to other countries.

So the Canadian energy situation can be summarized as being one of a delicate balance between disaster and prosperity. Like the United States we are faced with the potentiality of a serious dependency upon imported oil. But

unlike the United States we have the power to achieve independence and even a surplus in our own supply of oil and gas within a relatively short time.

Realization of this fact is of great importance. If the views of the doubters, the sceptics, and those who always say die prevail, we will adopt the policy of hoarding the meager reserves which we currently have developed. If, on the other hand we recognize the potential value of our oil and gas resources, we will adopt policies which will enable Canada to benefit from prevailing world energy conditions.

Canada's estimated remaining ultimate potential of oil amounts to approximately 310 billion barrels compared to our need of approximately 20 billion barrels over the next twenty-five years. However this estimate is somewhat misleading with reference to our near term needs for crude oil. Of this amount of oil approximately 200 billion barrels is potentially recoverable from the Athabasca oil sands and heavy oils. Production of this oil requires an enormous capital investment and hence must come on stream over an extended period of years. Of the remaining 110 billion barrels 5 billion barrels are in the flowing heavy oils of southeastern Alberta and western Saskatchewan. Because of its low productivity this oil is also limited in the rate at which it can be brought on stream. There is an estimated potential of 80 billion barrels of oil in the Canadian frontiers of the Arctic and East Coast. Although the wells from which this oil will be produced are expected to have high productivity characteristics, there remains the enormous task of building the facilities for the production and transportation of this oil - all of which will take a number of years to carry out.

Perhaps the best opportunity for the near term solution of our oil supply problem is to be found in the conventional oil reserves of the western Canadian sedimentary basin - both those reserves already discovered and those yet to be

discovered. It is estimated that there are 25 to 30 billion barrels of remaining recoverable potential oil in this area, including some 7.5 billion barrels of remaining proved reserves, and 6.0 billion barrels enhanced recovery potential of which 3.0 billion barrels is in existing established reservoirs.

Many of the reservoirs in Western Canada, under primary depletion methods, will yield as little as 6 to 10% of the oil in place. However, under high technology enhanced recovery the recoverable oil can be increased by about 4 to 6 times to 35 to 40% of the oil in place.

All of these new oil supply sources are extremely expensive, but given optimum economic conditions it should be possible almost to double Canada's remaining proved recoverable oil from conventional sources by the mid-1980's. The investment required to accomplish this goal will be enormous. We estimate that in order for Canada to acheive self sufficiency it will be necessary for the industry at least to double its current level of capital reinvestment measured in constant dollar terms.

Fortunately, the Canadian oil and gas industry has demonstrated a willingness and ability to respond to economic incentives. In 1973 industry revenue was $3.0 billion of which $1.3 was expended in royalty, operating costs and taxes, leaving $1.7 billion prior to investment and return on investment. In that year the industry invested approximately $1.3 billion.

Over the intervening five year period domestic oil prices rose by 250% from $3.50/barrel to $12.25/barrel. Industry revenue rose to $10.4 billion in 1978 of which $6.1 billion was expended on royalty, operating costs and taxes leaving a balance of $4.3 billion to the industry. In 1978

the industry expended the incredible amount of $4.6 billion in capital expenditures - more than all of the funds available after paying royalties, taxes and operating costs. In order at least to double capital investment needed to achieve self sufficiency, industry revenue must be substantially increased because it is axiomatic that the industry cannot expend more than it takes in over any extended period of time.

Since operating costs are relatively fixed, increased producer net-back can only come from increased oil prices and decreases in royalty.

On a previous occasion I recommended a two price system for Canada's crude oil - with new oil, including oil produced from high technology enhanced recovery projects, rising immediately to international levels, and with old oil rising from its current level to ultimately reach world levels say ten years hence. I also advocated a moderation in Government royalty levels on this increase in price.

Say for example that the government were to reduce its royalty on the increment of price increase by one half. This would increase the economic viability of new projects to the industry by at least a two fold measure. Let us also assume that the industry responded to these stimuli as it has in the past in proportion to the improved economics. This would mean that industry reinvestment would increase by at least two times. Based on current and projected finding costs, this would result in an increased rate of production of oil from the previously anticipated 1.3 million barrels per day in 1985 to 2.1 million barrels per day in that year, compared to an estimated consumption of 2.0 million barrels per day of oil; and increased gas production to 4.0 TCF per year versus 2.7 TCF per year of domestic gas demand.

The industry has demonstrated its ability to expand its capital investment by more than tripling its expenditures on exploration and development over the past five years. There

is no reason to assume that given favourable circumstances the industry cannot duplicate this performance over the next five years.

In specific terms we have estimated that the payment of international prices for new oil could, through the application of high technology enhanced recovery processes, increase Canada's production of oil from existing fields by aproximately 300,000 to 400,000 barrels per day by the mid 1980's. From the western sedimentary basin alone new oil from recent and new discoveries could be brought on stream over the same interval at approximately equal rates. This, plus additional oil sands and heavy oil supply capability, would be more than enough to offset contemplated production declines plus growth in consumption, and would enable Canada to achieve self sufficiency in crude oil production by the mid 1980's.

The average annual cost during the 1980's to the domestic consumer of oil and gas of the above price and royalty policy is estimated to be some $8.5 billion per year - over and above the present $12 billion per year costs. Without this type of new oil incentive price policy, Canadians would likely pay an average of over $10 billion per year in the 1980's for the necessity of importing foreign oil to make up the shortfall otherwise likely to be encountered. Further, if one subtracts from the consumer cost an estimated $4 billion in government revenues resulting from the increased new domestic oil production, assuming this was passed back to the consumer in the form of decreased taxes, Canadian consumers would be over $5 billion per year further ahead than otherwise. This is over and above the multiplied employment and income benefits generated within the Canadian economy due to a high level of internal reinvestment and the security of supply acheived.

The principle of the need to stimulate the discovery and production of new crude oil has been well recognized by the Province of Alberta. Alberta provides a cash bonus of approximately 35% of the cost of eligible exploratory wells and a five year royalty free period on new oil discoveries. Also, the province charges approximately a one-third lower royalty rate on new oil versus that levied on old oil. Alberta also allows the deduction of a substantial part of the cost of schemes for enhanced recovery of oil against royalty payable. The wisdom of these incentives is demonstrated by the fact that far from costing Alberta, these incentives in fact operate to the province's benefit through the resultant increase in exploration and production which far outweigh their cost.

Specifically, in the case of exploratory expenditures the provinces recognized that less than 10% of the total cost of finding and developing oil and gas is represented by eligible exploratory costs. Hence these incentives are seed money which yield bountiful returns when discoveries are made. By the same taken, although royalties on enhanced recovery schemes may be reduced to as little as one third the full rate, if their application results in four to six times the normal primary recovery, the province is the beneficiary in the long run.

The Federal Government also provides valuable incentives to encourage exploration which are applicable throughout Canada. However, because of the high cost of wells in the frontiers these incentives have their main application in this region. The incentives, although not as generous as those available in the provincial regions are very useful. In essence the Federal Government allows an additional depletion allowance of 66-2/3% of all costs of a well over $5 million. A simple comparison with the incentives in the provinces might be made on the basis that the provincial incentives are worth approximately 35 cents of the exploratory dollar whereas frontier depletion is worth 31 cents on the exploratory dollar. The prudence of this tax provision

will be recognized by the fact that after a major discovery is made in federal areas the Federal Government will receive in royalty and taxes approximately 60% of the total revenue after deduction of operating costs. Out of the remaining revenue the industry must recover its costs of exploration and development and its return, if any, on its investment.

The Canadian crude oil equation is very simply - Canada is faced with the prospect of a disasterous short fall in crude oil supply - to acheive self sufficiency industry must at least double its rate of investment in real terms - since the industry is currently reinvesting its entire cash flow the industry net back must be increased.

There are some people who are so short sighted as to criticize tax incentives afforded the petroleum industry and are particularly critical of companies which do not pay current tax. The tax incentives are provided to encourage exploration - those companies which respond to these incentives are able to defer current tax. In other words, if the incentive system is working those companies who respond defer payment of current tax - those companies which do not respond pay current tax.

Perhaps I could take our own company as an illustration of this point. In 1978 we deferred payment of current tax. However, in order to do this we reinvested approximately 200% of our cash flow in drilling and production operations in Canada. By the end of the current year one-eighth of the active drilling rigs in Canada will be under contract to our Company. In addition to the vigorous exploration effort that we are conducting we have also been responsible for substantial industrial activity in Canada including the construction and modification of three ships in Canadian shipyards in 1978 and the purchase of compressors, pipe, equipment and supplies from all regions of Canada.

It has been suggested that instead of providing tax incentives for exploration perhaps the government should explore the frontier regions through a crown corporation. It would appear that the logic of this argument is that instead of grating incentives governments shoudl take the revenues which would otherwise be derived and explore on its behalf. If one accepts the logic of that argument, then since incentives in the provinces are even more attractive than those in the frontiers, presumably governments should take over all exploration activities throughout Canada. In other words take over the one industry in our lagging economy which is creative, vigorous and expanding.

The Canadian petroleum industry is a highly sophisticated industry comparable to any other in the world. It is diversified, competitive and well financed. It has demonstrated a remarkable ability to respond to changing events. Such an industry is more than just money - its essence is the application of imagination and enterprise to the solution of problems. In fact, on occasion the lack of money provides the incentive to find new and better ways of accomplishing goals. Today, we have an industry with hundreds of competing companies each with its own ideas and each with the discipline of needing to make a profit to survive. The notion of substituting a monolithiic government corporation in its place, a corporation with one set of ideas and a confused bureaucratic direction, is a terrifying concept.

One must realize, at least in the case of our Company, that the drilling we are currently conducting in the Canadian Arctic is the culmination of activities which commenced in 1961 with the drilling by our Company of the first well in the high Arctic, Dome et al Winter Harbour #1 on Melville Island. In the intervening period we have drilled many wells in the Canadian Arctic, first as operator of PanArctic Oil Limited and later on our behalf. We have conducted

many thousands of miles of seismic, expended over $300 million in drilling equipment and carried out work on many of our Arctic permits since 1960. Concurrent with our exploratory activities we have also commenced the design of a new generation of drillships and have completed engineering work on production platforms necessary for the production of oil and gas from the Arctic. We have also carried on extensive studies of Arctic Marine transportation systems and have recently completed the construction of an ice-breaker of advanced design which, it is hoped, will place Canada amongst the leading nations of the world in Arctic marine transportion. The bill to take over such an operation would be extremely high and would result in a loss of momentum which would retard frontier exploration for many years.

We in Canada, with our vast potential supplies of petroleum hydrocarbons, can do no less than take the actions necessary to solve our own problem and to assist in the supply problems of the rest of the western world to the extent that we have surplus supplies of petroleum hydrocarbons. In doing so, we will at the same time, be contributing substantially to the economic welfare of our own country.

Perhaps the main stumbling block we face in Canada results from the federal nature of our government. The solution to our oil supply problem lies in the application of the necessary economic incentives required to bring new crude oil supplies on stream. The granting of these incentives lies entirely in the hands of government since the producers net back is entirely dependent upon price, royalty and taxes, all of which are government controlled.

Unfortunately, it is the federal government which controls the income tax, the provinces, as the main owner of the oil and gas, which largely control royalty, and the two levels of government which control the price. Added to that is the need for the concensus of the consuming provinces to any resolution which is proposed.

Our confederation is perhaps faced with its greatest test. It is to be hoped that all of our political leaders will recognize that compromise in the position of each of our governments is necessary to achieve our national objective and that each should be willing to subordinate its objectives to the overall need of Canada. In the process of so doing we can achieve a level of economic prosperity substantially in excess of that which will be enjoyed by our neighbours to the great benefit of all regions of Canada.

Our political leaders in both levels of Government have a heavy responsibility. The future prosperity of our nation depends upon the wisdom of the actions of government over the next few months.

ADDRESS TO

THE CALGARY CHAMBER OF COMMERCE

June 20, 1979

by J. P. Gallagher
Chairman & Chief Executive Officer
Dome Petroleum Limited

# PROPOSALS FOR AN ECONOMICALLY HEALTHIER CANADA

Our new Federal Government is faced with a major dilemma. The Conservatives have won the west, but must hold that position and gain strength in the major consuming centres of Quebec and Ontario, if they ever hope to form a majority Government.

One of the major political problems facing Joe Clark, Canada, and Confederation is how to resolve our energy problem in a way that is acceptable to all segments of this diverse country.

Canada is currently dependent on politically unstable foreign sources for one-third of its current crude oil requirements, and this dependence is growing annually.

Canada has massive proven but undeveloped reserves of tarsand and heavy oil, and huge potential reserves of conventional oil, all of which are economically viable at world prices.

Canada currently has an over supply of natural gas and a trended discovery rate which would indicate sufficient reserves to take care of our requirements for many decades. Canada's crude oil production capability is slightly less than current demand, and declining at over 7% per year in respect to future demand.

We need a major incentive to find and develop new crude oil reserves to ensure energy self-sufficiency and political independence.

The obvious suggestion by most oil producers and the Western Provinces is to pay the world price, and we will find and develop the necessary reserves. However, an immediate move to international pricing is not politically practical to the eastern consuming Provinces, as it would mean at least a doubling of product prices.

We, therefore, propose the following compromise that was initially suggested in broad terms by Premier Bill Davis of Ontario, and recently reiterated by my colleague, Bill Richards, in Edmonton, namely:

- Institute a two price system for domestic crude oil. Old oil would continue to sell at the same approximate 40% discount to current world prices, but escalate over a six year period so as to reach international pricing by 1985. Natural gas would track old oil prices on the current B.T.U. basis.

New oil would sell at the average landed price of world oil at Montreal, less transportation costs to that point.

The producing Provinces would undertake not to increase their percentage royalty as a result of the higher prices.

As many of you are aware, Alberta currently differentiates between old oil and new oil in applying a differential royalty which has been accepted by industry and works efficiently.

New oil in Alberta is less than 5% of our current conventional production, and tarsand oil is already being paid world price.

Under this arrangement, Ontario and Quebec should be relatively happy in that the impact of international pricing would be cushioned and gradual over a six year period, and consumers would be assured of a long term domestic supply of crude oil by the discoveries resulting from the increased incentive.

The Western producing Provinces should not object in that there would be no actual reduction in their current income, and there would be a definite time commitment by the Federal Government as to when all oil would sell at international prices.

I also wish to make the following suggestions to our new Government.

Currently, there is a greater incentive to explore for oil in Alberta than on Federal lands, despite Super Depletion. I suggest that the Federal Government should at least extend the Super Depletion for a minimum of 5 years and allow a grouping of wells in areas such as the Arctic Islands, where each $40 million expenditure per year would qualify for Super Depletion.

As production of oil and gas is developed on Federal lands, all Canadians would benefit from the royalties and profit share payable to the Central Government. Increased production from Federal lands should also help diminish the current conflict between East and West.

I suggest that this Government should approve the oil and gas regulations governing Federal lands as quickly as possible so as to provide the long-term stability of contract that is essential to attract major industry investments. To date, we have been working on good faith.

The following illustrations may make these suggestions easier to follow.

CANADA

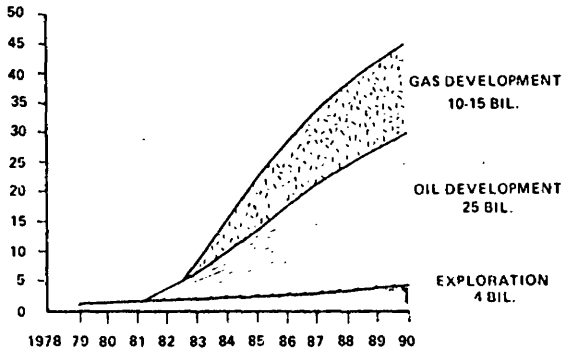
ECONOMIC IMPACT OF 1 MMBD
OF FOREIGN VS DOMESTIC OIL
(IN 1979 DOLLARS)

| | | FOREIGN OIL | DOMESTIC OIL |
|---|---|---|---|
| COST F.O. B. TORONTO | $/BBL. | $22.00 | $22.00 |
| TOTAL COST F.O.B. TORONTO | $ BIL./YR. | $ 8.0 | $ 8.0 |
| % SPENT IN CANADA | | NIL | 95% |
| AMOUNT SPENT IN CANADA | $ BIL./YR. | NIL | $ 7.6 |
| TOTAL ECON. IMPACT-MULTIPLIER (x3) | $ BIL./YR. | NIL | $22.8 |
| TOTAL GOV'T 'TAKE' (Est. 40%) | $ BIL./YR. | NIL | $ 9.1 |
| EFFECT ON THE ECONOMY | $ BIL./YR. | ($ 8.0) | $22.8 |

GOV'T TAKE INCLUDES FEDERAL & PROVINCIAL

1

BEAUFORT EXPLORATION
& DEVELOPMENT EXPENDITURES
(BILLIONS CONSTANT 1979 $)



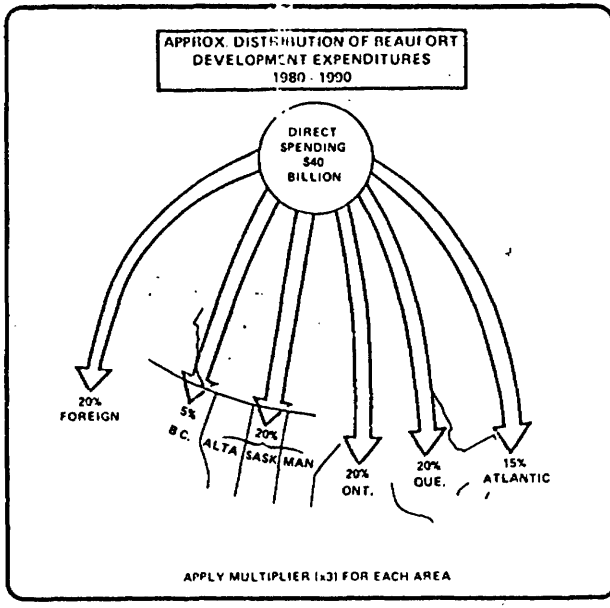

2

SLIDE NO. 1 shows the economic impact of importing foreign oil versus using domestic oil (in billions of constant 1979 dollars). This chart indicates that the economic impact of importing one million barrels per day of foreign oil at $22 per barrel has a negative effect on the economy of $8 billion per year. In contrast, using one million barrels per day of domestically produced oil at the same cost delivered in Toronto creates a positive annual economic benefit of $22.8 billion, which includes payments to the various levels of Government of $9.1 billion per year. In compiling the economic benefit of domestic oil, we have assumed that 95% of the finding, developing, and transportation costs would be spent in Canada, and have used a multiplier effect of 3 for every dollar spent in the natural resource segment of this country, and an average total Government take of 40% on the multiplied dollar.

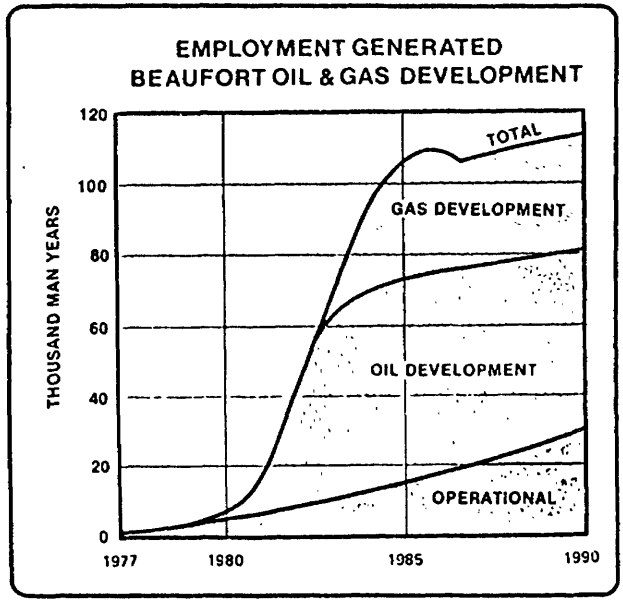
The financial gain on using domestic oil disregards the additional benefits to Canada in balance of trade, security of supply and the opening up of northern Canada for the development of other mineral resources.

SLIDE NO. 2 shows anticipated Beaufort exploration and development expenditures to 1990 to develop an estimated 10 billion barrels of oil (five two-billion barrel fields) and 4 billion barrels of oil equivalent of gas.

Exploration expenditures to 1990 are estimated at $4 billion or less than 10% of the total expenditures of $44 billion. It is this small component of high risk, front end expenditure that requires long term tax incentives in order to trigger the much larger development expenditures and their tremendous "spin-off" or multiplier effect on the total Canadian economy.


APPROX. DISTRIBUTION OF BEAUFORT
DEVELOPMENT EXPENDITURES
1980 - 1990
DIRECT
SPENDING
$40
BILLION
20%
FOREIGN
5%
B.C.
ALTA
20%
SASK
MAN
20%
ONT.
20%
QUE.
15%
ATLANTIC
APPLY MULTIPLIER (x3) FOR EACH AREA

3


EMPLOYMENT GENERATED
BEAUFORT OIL & GAS DEVELOPMENT
THOUSAND MAN YEARS
120
100
80
60
40
20
0
1977
1980
1985
1990
TOTAL
GAS DEVELOPMENT
OIL DEVELOPMENT
OPERATIONAL

4

The estimated $25 billion for oil development includes the construction of drilling and production platforms in Southern Canada, and towing them to location. It also includes the construction in Southern Canada of icebreaker tankers for transporting the oil to market.

We forecast that this expenditure on oil will develop production of 500,000 barrels per day by 1985 and 1 million barrels per day by 1990.

The $15 billion estimated for gas development expenditures includes the construction in Southern Canada of development drilling and production platforms, tubular goods, and a major pipeline for transporting the gas to Southern and Eastern Canada.

SLIDE NO. 3 shows the approximate distribution of Beaufort development expenditures throughout Canada between 1980 and 1990. Using the minimum multiplier effect of 3 to these direct expenditures would indicate an approximate $120 billion impact on the Canadian economy during the next ten years.

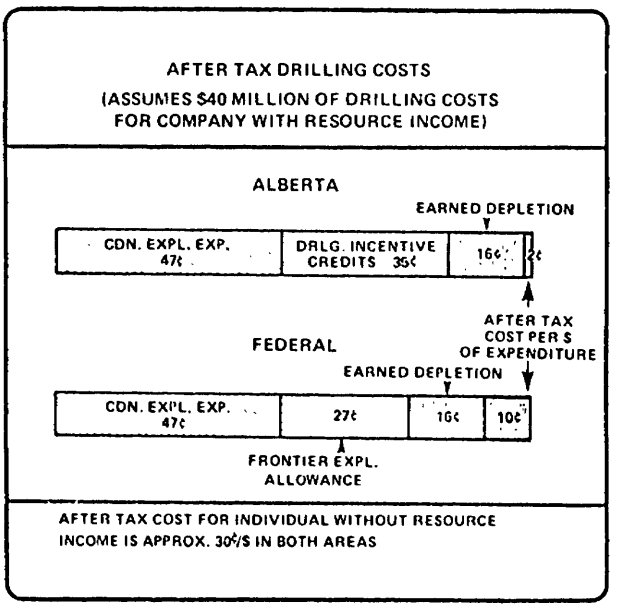
SLIDE NO. 4 shows the direct and indirect employment for Beaufort oil and gas development in thousands of man years. Beyond 1990 total employment projections continue to hold steady at over 100,000 man years as more fields are brought into production.

The hump in the gas employment curve in the years 1985 and 1986 reflects the building of a major gas pipeline from the Beaufort to Southern Canada.

SLIDE NO. 5 shows the after tax drilling costs for a Canadian company with resource income, assuming a $40 million drilling expenditure in either Alberta or on Federal lands. The bar graphs indicate the after tax costs per dollar of expenditure.

The 100% write-off of exploratory expenditures and earned depletion are common to both areas; however, the special drilling incentive credits available in Alberta are 8¢ per dollar more than the Frontier Exploration Allowance (Super Depletion) on Federal lands, which is only available on expenditures per well exceeding $5 million. This results in an after tax cost in Alberta of one-fifth that of the after tax cost on Federal lands.

The after tax cost for individuals with no resource income is approximately 30¢ per dollar in both Alberta and on Federal lands after allowing for the lower tax write offs on the first $5 million per well in Federal areas.




5



53-231 O - 79 - 10

Production found in Alberta results in earlier income due to the proximity of pipelines and markets. In Federal areas the possibilities of finding large reserves are greater, but this benefit is more than offset by the high risks, the major development expenditures, and the long lag between initial expenditures and first revenue.

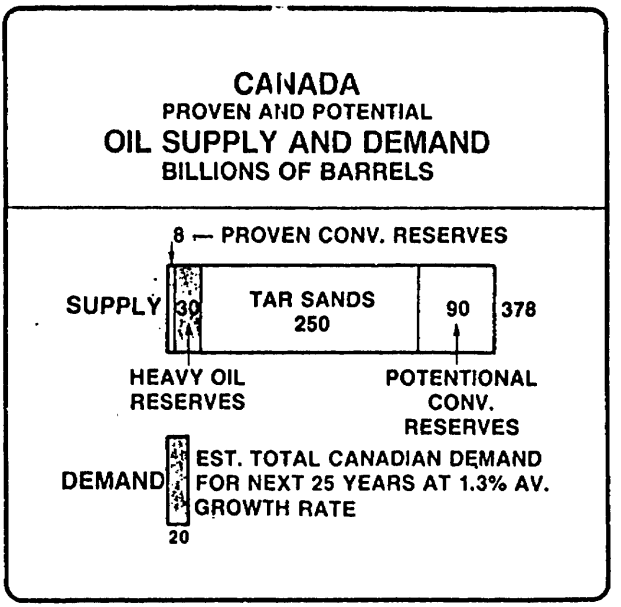
As you are aware, there has been a great increase in exploratory drilling and discoveries in Alberta during the past few years as a result of the increased exploratory incentive. This has resulted in major increases in hydrocarbon reserves and development expenditures. In contrast, there has been a major decline in exploration in Federal areas during the same period.

The Federal Government should therefore consider granting a minimum five-year extension of the current Super Depletion (15 to 20 months of actual offshore drilling), so that frontier explorers could carry out the necessary forward planning for new and modern drillships, and the design and engineering of ice resistant production storage and transportation facilities.

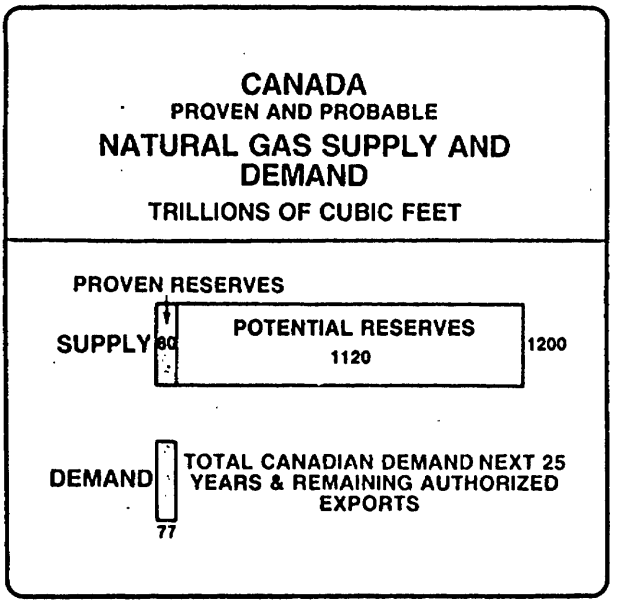
In order to encourage stepped-up exploratory drilling programs in the Arctic Islands (where onshore and ice-island wells cost considerably less than offshore Beaufort Sea and Labrador wells), we have suggested that consideration be given to allowing a grouping of wells (within a 100-mile radius)where each $40 million expenditure per year would qualify for the Super Depletion on all expenditures in excess of $5 million.

We suggest that a further extension of the Super Depletion Allowance to Federal lands is well protected by the proposed new royalty and net profits regulations. Using a 3 billion barrel oilfield as an example, the total payment to the Federal Government in royalty, profit share, and taxes, would be 152% of the producer's share with no financial participation or risk by the Government in the massive development expenditures.

As exploration expenditures are such a small part of the total development expenditures that will be necessary to bring oil and gas into production from the frontier areas, it is highly important to at least maintain the current exploration momentum in order to determine the extent of the hydrocarbon reserves and assist in the setting of a practical energy policy for Canada.


CANADA
PROVEN AND POTENTIAL
OIL SUPPLY AND DEMAND
BILLIONS OF BARRELS
8 — PROVEN CONV. RESERVES
SUPPLY
30
TAR SANDS
250
90
378
HEAVY OIL
RESERVES
POTENTIONAL
CONV.
RESERVES
DEMAND
EST. TOTAL CANADIAN DEMAND
FOR NEXT 25 YEARS AT 1.3% AV.
GROWTH RATE
20

6


CANADA
PROVEN AND PROBABLE
NATURAL GAS SUPPLY AND
DEMAND
TRILLIONS OF CUBIC FEET
PROVEN RESERVES
SUPPLY
80
POTENTIAL RESERVES
1120
1200
DEMAND
TOTAL CANADIAN DEMAND NEXT 25
YEARS & REMAINING AUTHORIZED
EXPORTS
77

7

SLIDE NO. 6 shows Canada's proven and probable oil reserves and demand in billions of barrels.

On the supply side, Canada has 8 billion barrels of proven conventional reserves, a minimum of 30 billion barrels of heavy oil reserves and an estimated 250 billion barrels of tarsand oil recoverable from over 600 billion barrels of tarsand oil in place. We have also shown a potential of 90 billion barrels of conventional reserves, the majority of which will be found in the frontier areas.

This total of 378 billion barrels compares to the estimated total Canadian demand for the next 25 years of 20 billion barrels.

The reserves are there, and are economically viable at world pricing.

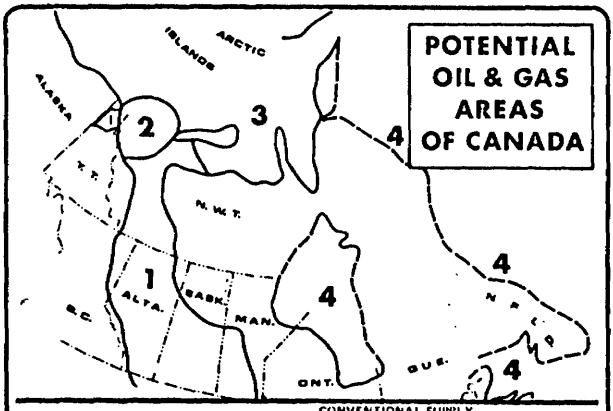
SLIDE NO 7 shows Canada's proven and probable natural gas supply and demand in trillions of cubic feet.

We have shown a conservatively estimated 80 trillion cubic feet of proven reserves and a total of 1,200 trillion cubic feet of proven and probable reserves, as compared to a total Canadian demand for the next 20 years of 77 trillion cubic feet, including authorized exports.

SLIDE NO 8 shows the potential oil and gas areas of Canada with estimated potentials for the various areas as compiled by the Geological Survey of Canada.

In our opinion, the sectors that have the greatest potential are Area 2 (Mackenzie Delta/Beaufort Sea area) with a potential of 94 billion barrels of oil and oil equivalent of gas; and Area 4 (East Coast Offshore Labrador and Davis Strait) with a potential of 115 billion barrels of oil and oil equivalent of gas.

As the Geological Survey estimates were made in 1975, prior to the oil and gas discoveries in the Beaufort Sea and offshore Labrador, we suggest that their maximum potentials should be readily attainable.




CONVENTIONAL SUPPLY
ULTIMATE POTENTIAL RESOURCES

| AREA | 50% PROBABILITY OIL B.Bbls. | 50% PROBABILITY GAS TCF | MAX. POTENTIAL OIL B Bbls. | MAX. POTENTIAL GAS TCF | O.A.O.E.G. B Bbls. |
|---|---|---|---|---|---|
| 1. W. CANADA | 13 | 107 | 29 | 228 | 68 |
| 2. MACKENZIE BEAUFORT | 7 | 60 | 36 | 339 | 94 |
| 3 ARCTIC ISLANDS | 4 | 51 | 17 | 319 | 72 |
| 4 EAST COAST | 6 | 43 | 55 | 348 | 116 |
| Total (Arithmetic) | 30 | 261 | 137 | 1234 | 350 |
| STATISTICALLY WEIGHTED TOTAL | 30 | 277 | 97 | 750 | 226 |

SOURCE - GEOLOGICAL SURVEY OF CANADA, 1975

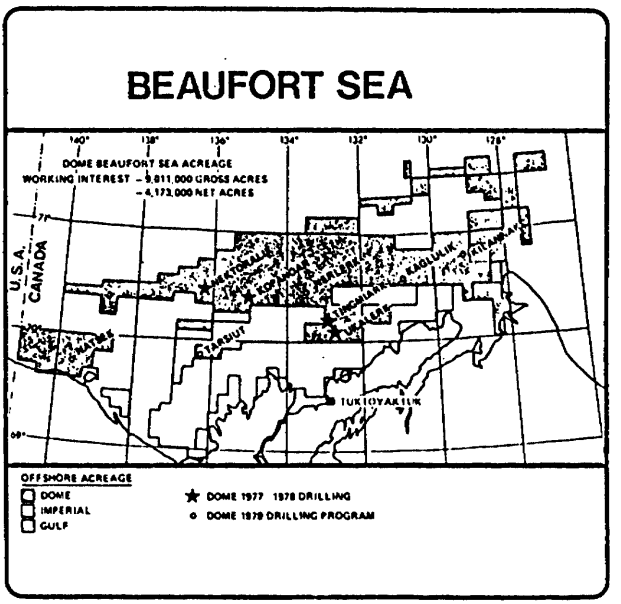
8

SLIDE NO. 9 shows the Mackenzie Delta and Beaufort Sea area of Canada which has all of the geological attributes that are essential for the generation and accumulation of major oil and gas reserves.

On this slide we have shown the location of Dome's working interest on over 9 million gross acres, and the four oil and/or gas discoveries to date; namely, Nektoralik, Kopanoar, Ukalerk, and Tingmiark.

In prior years, gas and/or oil discoveries were made onshore or in shallow offshore waters by Imperial, Gulf, and Shell, who have jointly proved up over 7.5 trillion cubic feet of gas and approximately ½ billion barrels of oil to date. From experience in other great producing deltas around the world, the size and total reserves of oil and gas fields usually increase in an offshore direction where the better developed and cleaner sand reservoirs are generally found. The results in Dome's wells to date appear to substantiate this experience.

As a result of over $15 million and over 40,000 miles of seismic on Dome interest lands, over 45 excellent geological structures have been outlined, many of which are individually large enough to contain a Prudhoe Bay oilfield where in excess of 14 billion barrels of oil and oil equivalent of gas have been proven to date.



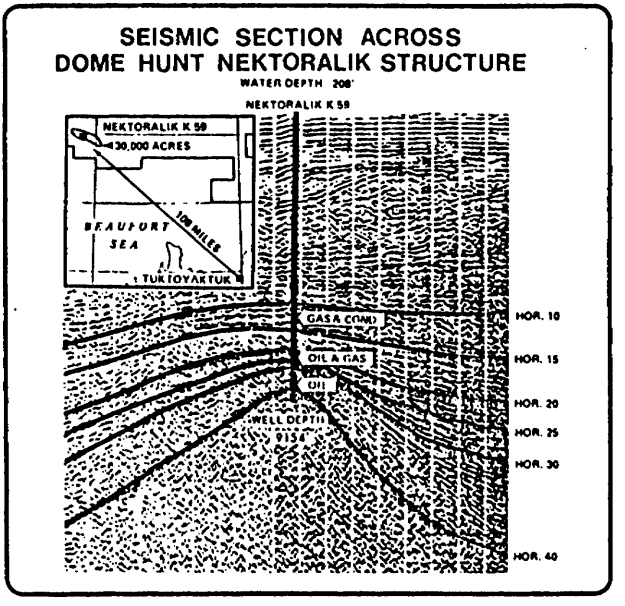

9

As Dome interest acreage is approximately one-third of the total offshore permit acreage, there should be at least 90 structures that merit testing.

Oil and/or gas have been flow tested in three significant zones at the 30,000-acre Nektoralik structure. Substantial thicknesses of oil and/or gas sands have been penetrated but not tested at Kopanoar and Ukalerk. These latter two wells, which reached depths of 14,000 and 16,000 feet respectively in 1978 will be thoroughly tested in July of this year.

Four additional wells were started in 1978 and carried to varying depths down to 8,800 feet. These holes will be re-entered this year and carried to final depths of approximately 14,000 feet.

SLIDE NO. 10 is a seismic section across the Dome Hunt Nektoralik structure located 108 miles offshore in the Beaufort Sea. This well was drilled to a total depth of 9,154 feet in 1977, where extremely high pressures were encountered, which made further drilling impractical. On testing this 30,000 acre structure, oil flowed from the lower zone, oil and gas from the middle zone, and gas and condensate from the upper zone approximately 1,000 feet above the base. No water was found in any of the three hydrocarbon zones.



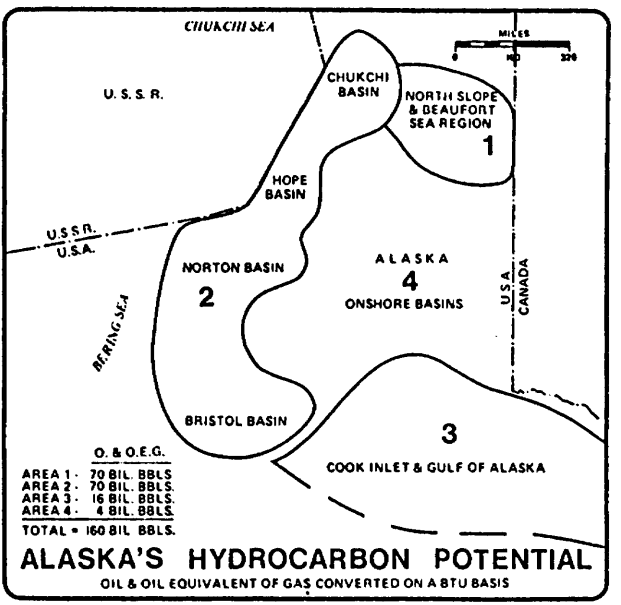

10

You will note that the productive sand zones thicken very quickly off the crest of the structure, which means that this feature grew during deposition, which is highly important in the trapping of oil and gas. With the absence of water, step-out wells on the flanks of this structure have a good chance of finding thicker oil and/or gas pay zones.

The untested Kopanoar well drilled in 1978 has considerably thicker sand zones containing both oil and gas, and appears to have even greater potential. However, the accurate determination of reserves in these large structures must await the drilling of one or two step-out wells from each discovery well.

SLIDE NO. 11 shows Alaska's hydrocarbon potential totalling 160 billion barrels of oil and OEG, broken down as follows:

| | |
|---|---|
| - North Slope and U.S. Beaufort Sea | 70 billion bbls. |
| - Western Alaskan sedimentary basins | 70 billion bbls. |
| - Cook Inlet and Gulf of Alaska | 16 billion bbls. |
| - Onshore basins | 4 billion bbls. |




11

Over 60% of the entire outer U.S. continental shelf lies offshore Alaska and represents approximately the same percentage of the U.S. undiscovered offshore potential.

SLIDE NO. 11A (not reprinted due to confidential nature) shows the northeastern sector of Alaska from the Prudhoe Bay oil field east to the Canadian border. The slide indicates the locations of fourteen highly prospective seismic structures many of which are as large as Prudhoe Bay in areal extent. The onshore oil and gas seeps are also highly significant.

Our company through its subsidiary, Canadian Marine Drilling, operates a fleet of three drillships, seven icebreaking supply boats, three ocean-going barges, and a large supply vessel, with a total investment including our supply base of approximately $250 million.

A new Class 4 powered icebreaker and a fourth drillship will be added to this fleet in 1979.

This fleet is ice-reinforced and is designed to operate in the Beaufort Sea for approximately four months per year after which it is moved to a sheltered location and frozen in for the remainder of the year.

To date, Dome has been permitted to deep-drill a total of 135 days in 2½ years due to Government and ice restrictions. As a result of this major under-utilization of equipment, drilling costs per operating day are the most expensive in the world.

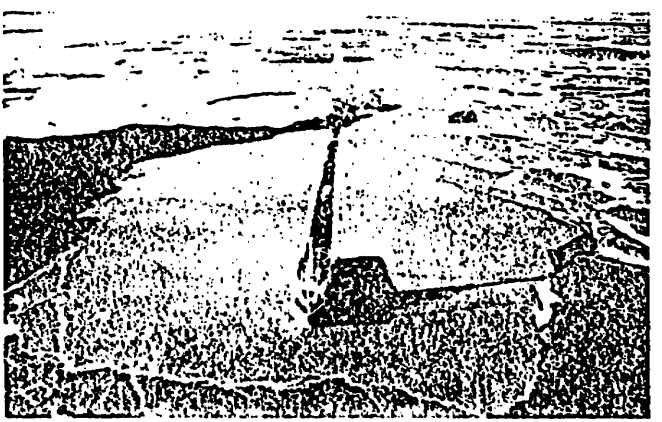
The Arctic is not geographically remote. The distance from the Beaufort Sea to Japan is only one-half the distance from Japan to the Persian Gulf. The distance from the Beaufort Sea to New York and Rotterdam is only one-half the distance from these seaports to the Persian Gulf via the Suez Canal, and one-third of the distance via the Cape.

The environment of the Canadian Arctic is harsh, but not forbidding. Parts of southern Canada and northern U.S. register lower temperatures each winter than occur along the Northwest Passage. The intensity of wind in the Arctic is exceeded in many parts of the world, and the violence of the sea along the Labrador Coast, in the North Sea, and even the Gulf of Mexico, makes the Beaufort Sea look like a mill pond. The for-

midable barrier in the Arctic is ice, but our operational experience shows that great strides can be made in advancing Arctic marine technology through practical on-site research. In addition to Dome's search for major oil and gas reserves, we suggest that our operations comprise the best possible Arctic ice laboratory.

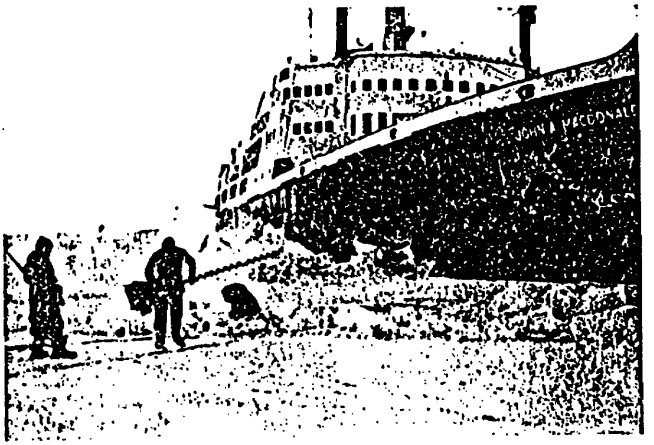
Only three years after placing first generation Arctic drilling systems in the Beaufort Sea, and after stretching the capability of these systems to a four month drilling season in 1978, we can now visualize second generation marine drilling systems which could operate year-round.

The following SLIDES 12 - 15 show some action shots in the Beaufort Sea area.



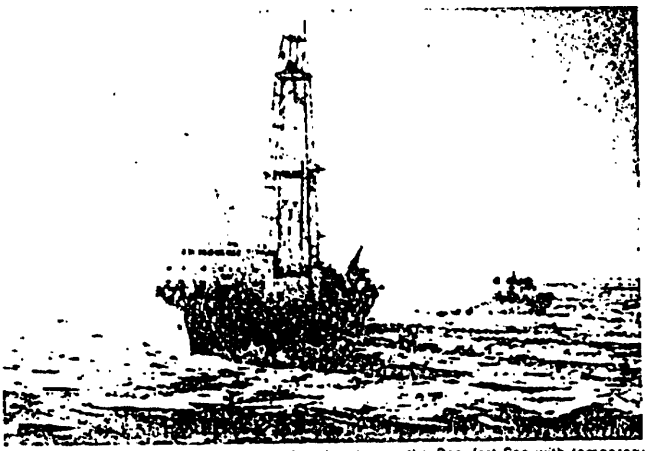
12

*Underwater seismic surveying in the Beaufort Sea.*




13

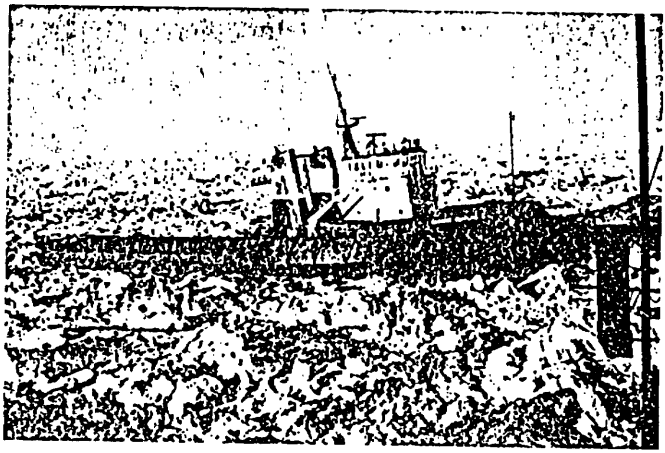
*The 18-year-old John A. MacDonald is a Class 3-15,000 h.p. Government ice-breaker (leased to Dome for ice research) penetrating a sixty-foot ice ridge. The men have just completed boring through the ice ridge to determine its thickness*



14

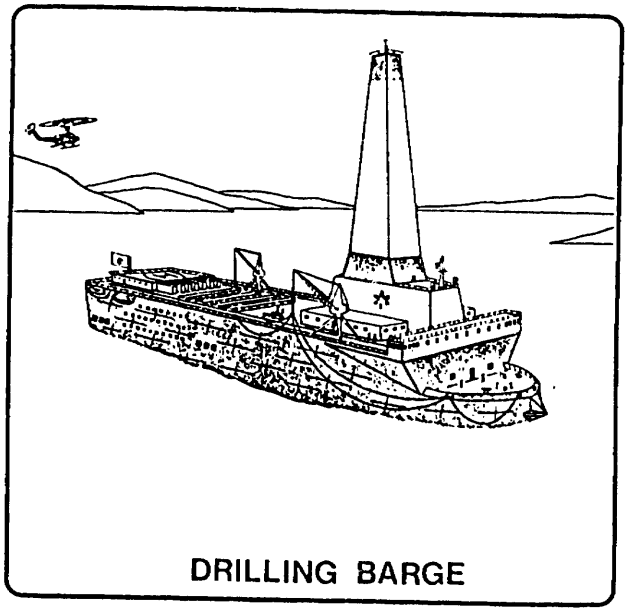
*Canmar ice-reinforced drillship moored on location in the Beaufort Sea with temporary polar pack ice cover moving at 1-2 knots over the drillsite*

15



*Canmar Arctic Class 2 ice-breaker supply vessel breaking up ice floes in proximity to an operating drillship*

16



SLIDE NO. 16 is an artist's sketch of our proposed new ice drilling barge which will enable drilling to be extended over a substantially longer season in the Beaufort Sea and on a year-round basis in land fast ice and in the areas between the Arctic Islands.

This vessel will have a Class 10 hull and a number of unique features including a special 16 anchor mooring system which will minimize the forces on the hull of the vessel and prevent deep ice ridges from damaging the drilling conductor between the wellhead and the drillship. The existence of this vessel should not only expand the drilling season but also increase the safety and reduce drilling costs.

The estimated cost of this proposed Ice Drilling Barge is $70 million.

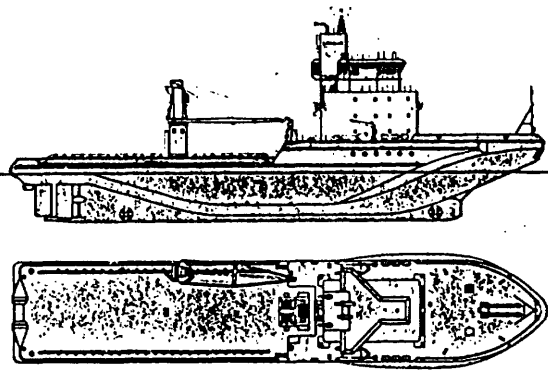
SLIDE NO. 16 A ( not reprinted due to confidential nature) is a diagram showing a comparison of conventional drillship mooring with the Ice Drilling Barge Offset Turret Mooring System.

You will note that the conventionally moored drillship does not allow rotation when wind and ice directions change. As a result, when the ice direction is broadside, the tension on the anchor chains is extreme. The Offset Turret Mooring System however allows the drillships to weather-vane and always turn the ice-reinforced bow into the direction of the advancing ice.

SLIDE NO. 17 is a diagram of a Class 4 powered icebreaker vessel designed by a Dome naval architect and currently under construction in a Canadian shipyard. It is scheduled for delivery to the Beaufort Sea in early September, 1979. Class 4 means the vessel has the capability of breaking an average of 4 feet of ice in a continuous mode at a minimum three knots.

This vessel embodies all the latest design principles for ice-strengthened hulls and will also test several new concepts. These features have been fully tested in both U.S. and Canadian ice model tanks and should give at least equal or better performance compared to existing icebreakers of similar size and power, but at one-half the capital cost.

# AML X4 ICEBREAKER



| | |
|---|---|
| LENGTH | 300 Feet |
| WIDTH | 57 Feet |
| DISPLACEMENT | 7700 Tons |
| SHAFT HORSEPOWER | 16,400 |

17

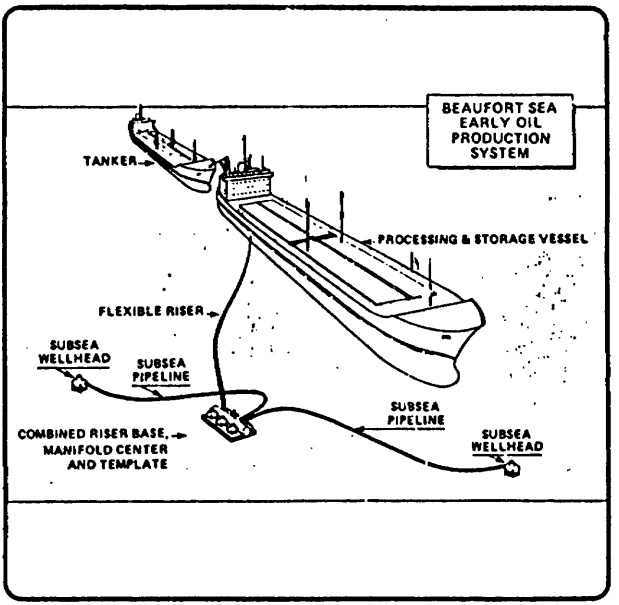
The AML-X4 is a scaled-down model of the AML Class 10 that Dome originally hoped to build with Canadian Government assistance, through a usage contract.

A normal icebreaker is elliptical in shape, which greatly increases construction costs when handling heavy steel. Among the special features of the AML-X4 is a flat-sided hull (essential for future icebreaker tankers) with a special reamer on the bow.

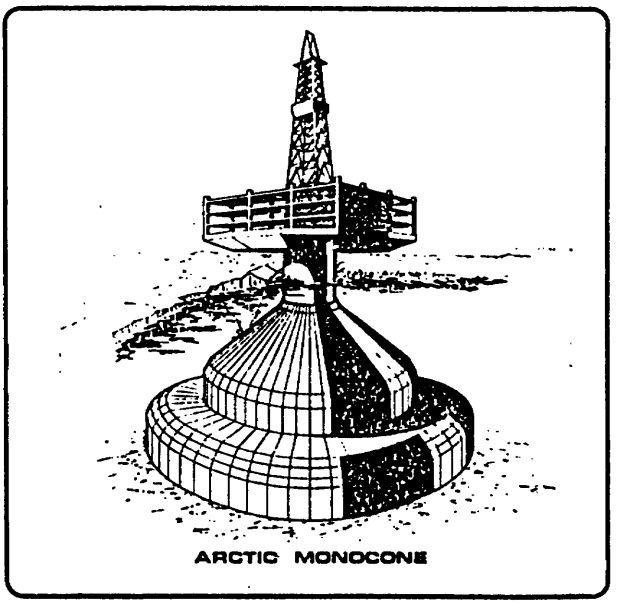
The vessel will also have a fully-tested friction-reducing feature and a spoon-shaped bow designed to break thick ice with a minimum loss of energy.

If the many experimental features of this vessel are a success, the impact could greatly reduce the cost of marine transportation throughout the Arctic.

Following the testing of this ship in the winter of 1979/80, Dome should be in a better position to design efficient icebreaker tankers for transporting oil from the Beaufort to North American East Coast ports.


BEAUFORT SEA
EARLY OIL
PRODUCTION
SYSTEM
TANKER
PROCESSING & STORAGE VESSEL
FLEXIBLE RISER
SUBSEA
WELLHEAD
SUBSEA
PIPELINE
SUBSEA
PIPELINE
COMBINED RISER BASE,
MANIFOLD CENTER
AND TEMPLATE
SUBSEA
WELLHEAD

18


ARCTIC MONOCONE

19

SLIDE NO. 18 is the proposed Beaufort Sea Early Oil Production System which is similar to that employed in the early stages of development in the North Sea. This system involves a relatively low initial capital expenditure and would be expected to be operational for only a portion of the year preparatory to the design and construction of year-round production facilities.

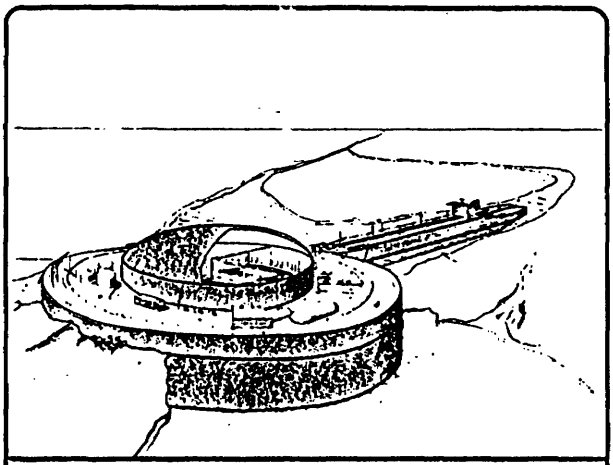
The permanent production system selected is entirely dependent on the water depth. Land fill islands are applicable out to water depths of approximately 100 feet, Caisson Islands between 100 and 150 feet and beyond this depth the gravity type Monocone offers the most practical solution.

SLIDE NO. 19 shows the proposed gravity-type drilling and/or production Monocone Platform designed to readily withstand ice pressures in the Beaufort Sea. The stem of this "inverted wineglass" is designed so that advancing ice rides up and breaks around the structure.

This permanent type of structure would be used for drilling a number of directional holes in the development of an oil or gas field. When the oil field is put on production, the base of the structure would be used for crude oil storage.

SLIDE NO. 20 shows a proposed crude oil storage and marine terminal for loading icebreaker tankers which would carry crude oil and initially LNG gas to East Coast ports. This terminal would be a heavy steel caisson filled by sand and gravel pumped from the sea floor.

Our economic studies indicate that, at least initially, oil should move out of the Beaufort by icebreaker tankers on a year-round basis. The threshold of reserves required to initiate oil movement by tankers is approximately 1/10 of that required to finance a pipeline resulting in earlier cash flow and an ability to increment the facilities as reserves and markets grow.



ARCTIC MARINE TERMINAL

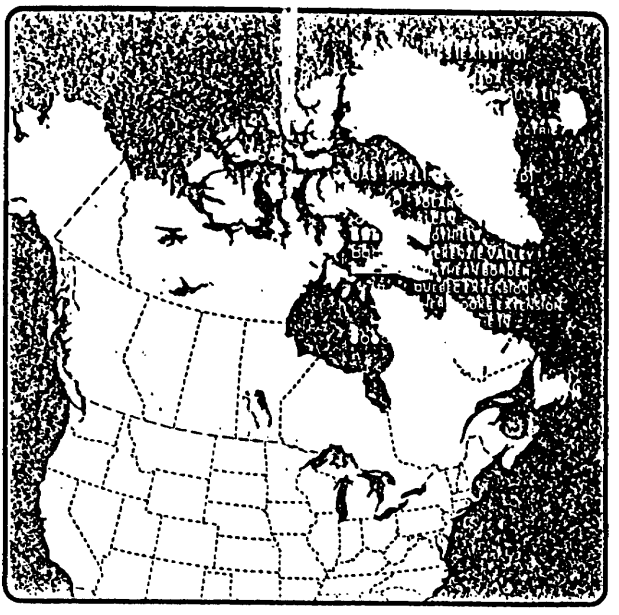
20

In addition, major facilities can be constructed in southern Canada and towed to the site. This permits better cost control, minimal environmental and social impact, and spreads the work and benefit throughout Canada.

Our target date to commence moving Beaufort Oil to East Coast ports is 1985.

SLIDE NO. 21 shows existing and proposed gas pipelines in Canada. Under proposed pipelines we have shown the Alcan/Foothills pipeline from Prudhoe Bay to southern Alberta and the proposed Northern Border pipeline from southeast Alberta to the Chicago area to carry Alaskan gas to the U.S. midwest. We have also shown the proposed Dempster lateral from the Mackenzie Delta to the Alcan pipeline and a proposed all-Canadian pipeline from the Beaufort Sea/Mackenzie Delta up the Mackenzie Valley to tie into the existing Alberta Gas Trunk system in Alberta.

24



21

The value of the Mackenzie Valley route is that it follows a sedimentary basin throughout its entire length where a number of small gas fields have already been found and where there is a potential for numerous additional gas and/or oil pools all of which will forever remain non-economic to gather if a major pipeline is not built within close proximity.

The additional cost of transporting Mackenzie Delta/Beaufort gas via a 30" Dempster spur pipeline has been estimated at $2.7 billion. We suggest that a contribution of half of this amount towards a Mackenzie Valley pipeline would give the U.S. an alternate source of gas via a completely separate pipeline which has considerable security value.

We have also shown the route of the proposed Polar Gas Pipeline from Melville Island along the west side of the Hudson Bay to tie into the TransCanada system. We suggest that the Polar Pipeline will not be built for many years.

In our opinion the most practical method of moving Arctic Island gas to market is by icebreaker,LNG tankers which shows the following advantages:

- Operations and cash flow can commence on 1/10 the threshold of gas reserves required to anchor a large pipeline.

- Major facilities can be constructed in southern Canada and towed to the site. This allows for better cost control, minimal environmental and social impact and spreads the work throughout Canada.

- Facilities and gas volumes can be incremented to reserve and market growth.

* * *

I hope that the previous slides and the following political suggestions will provide the basis for a good question-and-answer period.

Under our current system of Government, based entirely on representation by population, it is difficult to expect any central Government to give the long-term pricing and tax incentives that are essential to encourage resource development, when the very existence of that Government depends on the support of the major consuming centres of this country.

I suggest that we need a better mix of representation by population and regional representation.

I therefore support the current move to upgrade the Senate, but suggest a system whereby half of the Upper House would be appointed by the Provinces for a six-year term, and half would be elected for a single six-year term, with no re-election and no re-appointments. Elections and appointments would be held or made every three years which would provide continuity.

The new Senate should have approximately equal representation from each of the Provinces with minor weighting towards the larger Provinces.

The Prime Minister could choose his Cabinet from either the House of Commons or the Senate which would give better regional representation in the Cabinet. A minimum of 50% of the Cabinet should be elected Members of either the Commons or the Senate.

The new Senate would have to approve all legislation that originates in the House of Commons, but could not defeat the Government.

The presence in the Upper House of major representation from the under-populated, resource rich areas of this country would bring a better understanding of the long term programs that are essential to fully develop our great resource base.

Remuneration should be sufficient to attract outstanding Canadians who have a desire to serve their country for six years but not make politics a career. This revolving type of a Senate would help bring fresh ideas and experience into Government, and those returning to industry would bring a better understanding of the problems of Government to the general public.

Compromises between regional and economic interests would have to be made, but that is part of good government in a country as diverse as Canada.

In respect to the House of Commons, I would also suggest the following changes.

1. Once a leader of a Party is asked to form a Government, that Government should be given a minimum of two years before the vote of confidence would be allowed. This would give a new Government an opportunity to implement at least medium-range programs rather than short-term policies for political gain. It would also diminish the unwarranted strength of a small party holding the balance of power.

2. I suggest, that unless defeated by a vote of non-confidence, a Government would remain in power for a set period of four years from the date of election so that the governing party would not be in a position to choose or delay the election date--often to the detriment of the country.

3. I suggest that with our modern media and means of travel, a 30-day election period should be sufficient.

4. I suggest that the leader of any party in power would by law only be able to act as Prime Minister for a maximum of 8 years.

Canada has all the qualities for greatness and world leadership. Let's revise our political system so that we can all work together toward that goal.

Mr. NAEGELE. In short, I do not believe the United States will preferentially get increased energy from Canada for money alone. Certainly not long term, since it appears there are better alternatives available.

If Canadian provincial—and I stress provincial, because the provincial agreement are just as important as Federal for exports in Canada—if Canadian provincial, Federal, and business support is to be attained, then the United States must offer more than money.

It could offer to open its markets to selective upgraded products, primarily those derived directly from natural gas so that jobs are created in Canada and balance of payments are positively impacted. To this end, the premier of Alberta has proposed bilateral duty-free access for a limited list—and I stress the words "limited list" at this time—of chemicals in return for increased exports of natural gas.

This list included polyvinyl chloride, polyethlene, ethylene oxide, vinyl chloride, styrene, methanol, phenol, malic anhydride, pthalic anhydride and pentaery thritol.

A further refinement would be to allow duty-free access to the U.S. market for an amount of this list of upgraded hydrocarbons equal to a percentage of the natural gas exported by Canada to the United States.

Mr. Mort will have more to say along these lines.

However, reactions to forays on trades, et cetera, have given the impression that the United States feels Canada has no alternative and that it must sell its hydrocarbons to the United States. An example of that is also submitted, and has been, and I leave that for your perusal.

I assure you this is not the case in Canada, nor in Mexico. If the United States wants energy and hydrocarbons from Canada and Mexico it should capitalize on the remainder of its reservoir of friendship and respect and offer that which your northern and southern neighbors need.

Job opportunities for their citizens and a portion—a portion—of the upgraded manufacturing facilities that will supply growing U.S. markets.

From the point of view of Canadians, the export of oil and gas is not just the export of a key resource. It is also the export of jobs. I believe Canadians would be receptive to overtures based on benefits to both countries. I sincerely hope you can make it possible for your friends to the north to preferentially want to export additional energy supplies to the United States.

Please remember that all thousand mile journeys are accomplished one step at a time and nothing at all happens until the first step is taken. Selective free trade for a limited number of petrochemicals as proposed by the Premier of Alberta, to go with increased natural gas exports, could be that first step.

Thank you for inviting me.

Senator BAUCUS. Thank you very much, Mr. Naegele. That was a very good statement.

Mr. Mort?

Mr. MORT. Thank you, Senator Baucus.

STATEMENT OF C. L. MORT, VICE PRESIDENT, NEW BUSINESS VENTURES, SERVICES AND GOVERNMENT AFFAIRS, DOW CHEMICAL OF CANADA, LTD.

Mr. MORT. Let me introduce myself. I am vice president of Dow Chemical of Canada. I am a Canadian by birth and have lived my entire life in Canada.

I, too, feel honored to have been invited here today to have the opportunity to express my views before your subcommittee.

Almost my entire career has been spent working for a multinational, the Dow Chemical Co., which I joined in January of 1951.

Most of that career has been spent in the business area for Dow and a good portion in the last few years has been spent spearheading a basic petrochemical project in the province of Alberta. The economic problems of the Canadian petrochemical industry have been present for many years and relate largely to the small size of the Canadian market and the problems of scale in building facilities in Canada to supply just the Canadian market.

These problems have historically resulted in unsatisfactory returns on investment by U.S. standards. The problems of market size are compounded even more by the very closeness of the majority of the Canadian population to U.S. advertising media and manufactured goods available from the United States into Canada. The basic per capita consumption of petrochemicals in Canada has historically run on the order of about one-half that of the United States.

While it is difficult to define, it is my belief that the actual per capita consumption of petrochemicals in all consumer goods is approximately the same as that in the United States with about 50 percent of the consumption being in the form of plastics incorporated into refrigerators, household goods, toys, et cetera, that are imported by Canada from the United States.

Therefore, the Canadian petrochemical producer faces not only being restricted in sales to a market with a population one-tenth that of the United States but also faces one-half of its potential market being supplied by U.S. producers of consumer goods.

A Canadian company has no opportunity to participate in this portion of its potential domestic market. Very specifically, in 1978, Canada had an unfavorable trade balance with the United States on identified chemical imports and exports of roughly $900 million and, specifically in petrochemicals a deficit of about $400 million.

If we were to add to the identified raw petrochemical imports those that are imported in manufactured goods, then the trade deficit in petrochemicals alone would have exceeded $1 billion in 1978.

Suddenly, events have changed for the Canadian petrochemical industry. Plants are being built, or have been built in the last 1 or 2 years, both in eastern Canada and in Alberta, that are generally world competitive in size and with the latest technology. With a secure energy base, these projects can be competitive in the Canadian market, will be competitive in export markets other than the United States and could be competitive in a portion of the U.S. market if tariffs were not a consideration.

However, there will always be many other petrochemical products that must be imported into Canada because their limited use

will not justify Canadian production. Consequently, we will always have a deficit trade balance in these products.

Canada is currently exporting about 1.1 trillion cubic feet per year of natural gas to the United States and applications are before the National Energy Board of Canada that could result in an additional 0.7 trillion cubic feet of gas exports. Much of the U.S. production of one of the most important basic petrochemicals, ethylene, is based on raw materials extracted from natural gas streams.

The natural gas we are currently exporting in terms of Btu's is equivalent to approximately 75 percent to 80 percent of the hydrocarbons required for all existing U.S. ethylene production.

If the National Energy Board grants the additional quantities of natural gas exports to the United States that are under consideration, then we will be exporting substantially more petroleum hydrocarbons in the form of natural gas than the hydrocarbons required to produce all of the ethylene in the United States.

There was a hope that the just-completed Tokyo round of GATT negotiations might provide freer access for petrochemicals to the U.S. market. As a result of changing the basis for petrochemical tariffs from specific and ad valorem to ad valorem only, the U.S. chemical tariffs will be higher in the future for many petrochemical products important to Canada and Alberta than the tariffs that would have resulted if there had been no GATT round of negotiations. Therefore, the U.S. market does not look attractive under these conditions for surplus Canadian petrochemicals and Canadian producers are seeking other world markets.

In my view, Canada has proved to be the most reliable supplier of energy to the United States. If the United States expects to continue to have Canada as a reliable and increasing supplier of hydrocarbons, then it should make some access to the U.S. petrochemical market available, on a duty-free basis, in order to compete with other countries who are turning to Canada as a reliable energy supplier. Canadian tariffs on this same group of petrochemicals should also be reduced under such a bilateral arrangement.

I recommend for your consideration that Canada have the opportunity to supply 10 percent of hydrocarbons supplied to the United States in the form of certain petrochemicals derived from natural gas, specifically the list of products referred to earlier by Mr. Naegele.

We believe the effect on the U.S. petrochemical market would be negligible. Canada could not immediately take advantage of such a position but could grow, over a period of time, to that level.

Even when the full 10 percent were achieved, it would not represent more than a maximum of 10 percent of the U.S. petrochemical market.

That is barely more than 1 year's growth in the U.S market. This would be a very small sacrifice in terms of U.S. industry growth in order to obtain such secure hydrocarbon supplies.

Thank you.

Senator BAUCUS. Thank you very much, gentlemen.

One question I have is, Who, if anyone, would object to the proposal you are making? That is, in the United States.

That is, either an agreement where Canada would supply a certain percentage of its hydrocarbons in the form of petrochemical products or feedstocks in exchange for lowering the trade barrier—that is, the barrier to petrochemicals?

Mr. NAEGELE. I think you would find many in the chemical industry in the United States and in Canada who would object to that.

I do not think many people in industry on both sides of the border really have fully understood what has gone on in the world. They still believe in good fairies and televisionitis; that, within an hour, everything is going to be solved and it is not. Everybody wants the advantages, but somebody else ought to pay for it.

I really think industry has a long way to come, or many people in industry, to accept the fact that the world has changed—and that is on both sides of the border. I think the objections will come from there, and it will come from some of the political representatives that they both have.

Senator BAUCUS. So you do think initially, any way, that people in American industry will think that, you know, this is not fair, that we want to produce our own products for American markets and now you are lowering the barrier so the Canadian products can come down and compete unfairly and so forth. You think that would be the initial reaction, although when they start to analyze it——

Mr. NAEGELE. I can almost assure you it will be.

Senator BAUCUS. But when they start to analyze it more fully, you think that they will tend to agree with the kind of proposal that you are talking about.

Mr. NAEGELE. I think that they will have very little alternative because not only will they not have enough for their own business, unless you allocate preferentially to them and penalize other people in the United States, but if they do not get additional hydrocarbon supplies from someplace, they will not even be able to keep what they have going let alone expand.

So sharing that expansion in return for additional secure energy resources would seem to be very good business on their part, as well as anybody else's.

Senator BAUCUS. Have you approached the NEB, or anybody else in Canada, in a position of authority on this kind of question?

Mr. MORT. I have personally approached both the Provincial and Federal Governments. We have not approached the National Energy Board at this time with such a proposal.

Senator BAUCUS. What has been the initial reaction?

Mr. MORT. Well, of course, Alberta's position is they are very interested in a bilateral free trade arrangement. I think both Governments were extremely disappointed in the outcome of the Tokyo Round of GATT. The Federal Government has considered this type of proposal in the past. I am being a little bit more specific today than in the past, but this thought has been present in the Federal Government's mind for some time.

Senator BAUCUS. Speaking more generally and looking at the bigger picture, you are a company that has dealt on both sides of the border quite extensively. What suggestions do you have as to how we can generally improve trade between the two countries?

I am sure you are all familiar with hangups in various agencies and redtape and paperwork. Maybe you are not. I do not know.

You know better than I that probably trade barriers between our two countries are lower than they are between any other two countries, that is, between the United States and any other country—more private arrangements and agreements that are negotiated, entered into and consummated without governmental activity.

But I am curious as to what suggestions you might have, what can be done to improve the situation beyond the present condition?

Mr. NAEGELE. Mr. Chairman, the only thing that I can really suggest is that you take a first step and since we are merely refining a little bit a proposal the Premier of Alberta has already made to the U.S. Government, it is one that is laying on the table, it is not a bad thing to try. If it does not work, you can always back up and if it does, you can take the next step and see if that, too, cannot be mutually advantageous to both countries.

Anything that is going to work long term has to benefit both countries, or it will die one way or the other, and if you try to form a comprehensive plan to solve all problems, you will plan forever.

Senator BAUCUS. I understand your proposal comes back to natural gas and petrochemicals but what more generally can you recommend?

The subject of this hearing is a more general subject than the petrochemical industry. I am just curious to hear the benefit of your experience.

Mr. NAEGELE. I think most of what you have heard already. It may be a combination of reasons, but I think Canada and Mexico, and perhaps others in Latin America, have always had a little bit of big brotheritis in looking at the United States. It seems much more attention was paid to Europe and Japan. There were Marshall plans and MacArthur plans to put Europe and Asia on their feet.

We did not see those, and many of your friends in Latin America, and even in Canada, do not see those.

I think paying a little closer attention to this continent in general and strengthening this continent, even if it has to come with the expense of Europe or Asia, is a very solid thing to think about.

Senator BAUCUS. There is no doubt about it that, since the war, with the Marshall plan and the MacArthur plan, we have built up some very strong competitors across both oceans.

You heard Senator Van Roggen say how dependent Canada is now on oil imports. You quarrel a bit with his figures.

Mr. NAEGELE. Our figures came from Ottawa on Friday, so we may be slightly more current.

Senator BAUCUS. Franky, I was surprised you said 30 percent, too. The last I heard is 20 percent.

Mr. MORT. Our figure is a net figure.

Senator BAUCUS. Nevertheless, Canada is a net importer of crude oil. You, in your statement, Mr. Naegele, suggest that Canada may, in the future, be a net exporter of good oil—that is, the development of tar sands and perhaps some other sources.

To what degree, I think that is really going to be the case. I visited the tar sands operation a couple of months ago and my recollection is the productions were of 150,000 barrels a day, and

they hoped to get up to perhaps 500,000 barrels a day. I do not know how many barrels Canada imports in absolute terms, but the general impression I have is that there is a lot more gas than there is oil.

Mr. NAEGELE. There is a lot more gas currently recoverable. There really is an awful lot of oil in Canada. The question is, Do you know how to get it out? And we believe that the technology that has been developed and the knowledge that has been developed over the last 10 to 15 years will permit Canada to extract somewhere between 1 and 5 million barrels a day on a sustainable basis and that has nothing to do with tar sands or the Beaufort Sea, which may be even bigger than that.

These are conventional, known reserves, that have been known for many, many years, but people did not think they could get them out—and 20 years ago they could not.

Now, we can. It will not be free, but it still is economically possible at world prices today.

Senator BAUCUS. Turning back to another point made by Senator Van Roggen, you agree then that we should not look toward the North American common market or energy market, but rather we should look toward freer trade, essentially. Is that what you are saying?

Mr. NAEGELE. I think that is possibly the first step. I think the Common Market——

Senator BAUCUS. But he does not like linkage, though.

Mr. MORT. Senator Van Roggen, I understand, but this seems a very natural linkage. Are we going to export natural gas in its crudest form or export it in a step up the road?

I think there are clearly some business transactions that are being considered that are exactly on that kind of basis with other countries today.

Mr. NAEGELE. There are linkage arrangements being proposed and being accepted with his province and Alberta and the Canadian government, with countries other than the United States for the export of future oil, present gas, and upgraded products.

Those are very hot right now.

Senator BAUCUS. I suppose that the real question is how do you get the job done. How do you accomplish the result, regardless of what you call it.

I appreciate your statement very, very much. It is a subject that I have been interested in for some time—that is, the petrochemical sector as one example to free up trade between the two countries, and I do not think this is going to be the last time we are going to talk about it, but hopefully we can proceed more quickly than otherwise would be the case.

I want to thank you very much for coming.

Mr. NAEGELE. Thank you. We wish you luck.

Senator BAUCUS. Thank you.

[The prepared statements of the preceding panel follow:]

STATEMENT BY CLIFFORD L. MORT

I am Clifford L. Mort, Vice President of New Business Ventures, Services and Government Affairs, for Dow Chemical of Canada. I am a Canadian by birth and have lived my entire life within Canada. I, too, feel honoured to have been invited

here today and to have this opportunity to express my views before this Sub-Committee.

Almost my entire career has been spent working for a multi-national: The Dow Chemical Company, which I joined in January, 1951. Most of that career has been spent in the business area for Dow and, for a good portion of the last few years, I have spearheaded Dow's efforts, from a business standpoint, to establish a basic petrochemical industry in the Province of Alberta.

The economic problems of the Canadian petrochemical industry have been present for many years and relate largely to the small size of the Canadian market and the problems of scale in building facilities in Canada to supply just the Canadian market. These problems have historically resulted in unsatisfactory returns on investment by U.S. standards.

The problems of market size are compounded even more by the very closeness of the majority of the Canadian population to U.S. advertising media and manufactured goods available from the U.S. into Canada.

The basic per capita consumption of petrochemicals in Canada has historically run in the order of one half that of the U.S. While it is difficult to define, it is my belief that the actual per capita consumption of petrochemicals in all consumer goods is approximately the same as the U.S., with about 50 percent of the consumption being in the form of plastics incorporated into refrigerators, household goods, toys, etc. that are imported by Canada from the U.S. Therefore, the Canadian petrochemical producer faces not only being restricted in sales to a market with a population one tenth that of the U.S., but also faces one half of his potential market being supplied by U.S. producers of consumer goods. A Canadian company has no opportunity to participate in this portion of its potential domestic market.

Very specifically, in 1978 Canada had an unfavourable trade balance with the U.S. on identified chemical imports and exports of roughly $900 million, and specifically in petrochemicals a deficit of about $400 million. If we were to add to the identified raw petrochemical imports those that are imported in manufactured goods, then the trade deficit in petrochemicals alone would have exceeded a billion dollars in 1978.

Suddenly, events have changed for the Canadian petrochemical industry. Plants are being built, or have been built, in the last year or two years, both in Eastern Canada and in Alberta, that are generally world-competitive in size, and with the latest technology. With a secure energy base, these projects can be competitive in the Canadian market, will be competitive in export markets other than the U.S. and could be competitive in a portion of the U.S. market if tariffs were not a consideration.

However, there will always be many other chemical products that must be imported into Canada because their limited use will not justify Canadian production; consequently, we will always have a deficit trade balance in these products.

Canada is currently exporting approximately 1.1 trillion cubic feet per year of natural gas to the U.S. and applications are before the National Energy Board of Canada that could result in an additional .7 trillion cubic feet of gas exports. Much of the U.S. production of one of the most important basic petrochemicals—ethylene—is based on raw materials extracted from natural gas streams. The natural gas we are currently exporting, in terms of BTU's, is equivalent to approximately 75 to 80 percent of the hydrocarbons required for all the existing U.S. ethylene production.

If the National Energy Board of Canada grants the additional quantities of natural gas exports to the U.S. that are under consideration, then we will be exporting substantially more petroleum hydrocarbons, in the form of natural gas, than the hydrocarbons required to produce all the ethylene in the U.S.

There was hope that the just-completed Tokyo Round of GATT Negotiations might provide freer access for petrochemicals to the U.S. market. As a result of changing the basis for petrochemical tariffs from specific and Ad Valorem to Ad Valorem only, the U.S. chemical tariffs will be higher in the future for many petrochemical products important to Canada and Alberta than the tariffs that would have resulted if there had been no GATT Round of Negotiations. Therefore, the U.S. market does not look attractive under these conditions for surplus Canadian petrochemicals and Canadian producers are seeking other world markets.

In my view, Canada has proved to be the most reliable supplier of energy to the U.S. If the U.S. expects to continue to have Canada as a reliable and increasing supplier of hydrocarbons, then it should make some access to the U.S. petrochemical market available, on a duty-free basis, in order to compete with other countries who are turning to Canada as a reliable energy supplier. Canadian tariffs on this same group of petrochemicals should also be reduced under such a bilateral arrangement.

I recommend for your consideration that Canada have the opportunity to supply 10 percent of hydrocarbons supplied to the U.S. in the form of certain petrochemicals derived from natural gas, specifically the list of products referred to earlier by Mr. Naegele. We believe the effect on the U.S. petrochemical market would be negligible. Canada could not immediately take advantage of such a position but could grow, over a period of time, to that level. Even when the full 10 percent were achieved, it would not represent more than a maximum of 10 percent of the U.S. petrochemical market. That is barely more than one year's growth in the U.S. market. This would be a very small sacrifice in terms of U.S. industry growth in order to obtain such secure hydrocarbons supplies.

Thank you.

---

STATEMENT BY ROBERT E. NAEGELE

I am Robert E. Naegele, President and Chief Executive Officer of Dow Chemical of Canada, Limited. For nearly four years, I've had the privilege, as a U.S. citizen, of living and working in the dynamic country on our Northern borders. I am honored to have been invited to share my thoughts and opinions.

Canada, in terms of per capita natural resources, is perhaps the wealthiest nation on earth. It is a vast country with a small population, a stable, democratic government oriented to free enterprise, with a reservoir of friendliness to and respect for its gigantic, ofttimes insensitive neighbour to the South.

In testimony before this Committee on June 6, 1979, Paul Oreffice, President and Chief Executive Officer of our parent company, cut to the heart of the matter by stating that the serious problem facing the United States is energy, and proposed a North American Economic Union that would benefit Canada and Mexico as well as the U.S. This was quickly picked up by some U.S. spokesmen and the media, restated as a North American Energy Pool and transmitted to Canadian ears to mean the U.S. had the right to, and would magnanimously agree to share, the hydrocarbons and energy of Canada and Mexico. The Canadian reaction, as you might imagine, was considerably less than enthusiastic.

Despite its wealth in per capita resources, Canada has many of the same problems as the U.S.—unemployment in excess of 8 percent, and unfavorable balance of payments of $6 billion (mostly with the U.S.), a weak dollar, unacceptable inflation, a plethora of social programs that are currently unaffordable and a present shortage of oil. While this is true, there is a difference between the two countries. In my opinion, Canada has the opportunity and national will to solve its problems in the eighties and, while the U.S. has the opportunity, it has yet to demonstrate that it has any clearly defined programs in place. Mr. Oreffice pointed out that the U.S. has energy self-sufficiency in its grasp but suppresses almost all by catering to vocal minority cultists. Hopefully, this Committee and others will change the course and direction of U.S. policy.

Now to the heart of the matter as it relates to energy and trade between the U.S. and Canada. Canada is essentially self-sufficient in energy. It exports more hydrocarbon BTU's than it imports. Canada currently produces 3 trillion cubic feet of gas per year and exports roughly one-third of its total production to the U.S. Canada's potential, marketable gas reserves, as listed by The National Energy Board, would represent 50 years' supply, or 147 trillion cubic feet. There are those in industry who believe Canada has economically recoverable reserves of natural gas in excess of 1,000 trillion cubic feet. Please refer to a talk dated June 20, 1979, given by Jack Gallagher, Chairman of the Board of Dome Petroleum Limited, which has been submitted. Canada currently imports 16 percent of its crude oil needs. However, Canada can become self-sufficient in oil supplies by the mid-eighties. In fact, if you refer to the same talk by Mr. Gallagher, some believe production capabilities in Canada could match pre-revolutionary Iran or better before the end of the eighties, or certainly by the next century. All of this with only a negligible contribution from the vast Canadian tar sands.

I am also submitting talks by Mr. Richards, President of Dome Petroleum Limited, in April, 1979 on a "Blueprint for a Canadian Oil Surplus" and "Oil Self Sufficiency by the Mid 1980's—an Achievable Goal for Canada", as well as copies of talks by Mr. Mort and myself. If even part of the foregoing is true, then Canada can and will become a much larger exporter of hydrocarbons with time. In fact, considerations are currently under study to increase those exports now.

Before you take any consolation in what I've said, please understand that the U.S. is not the only alternative to Alberta or to Canada. Pipelines to Eastern Canada, replacing oil with natural gas there and anywhere else in Canada, sale to Japan of LPG's and other upgraded energy and hydrocarbons may at this point be preferable

to increased sales to the U.S. of straight natural gas. The same will be true when Canada becomes a large exporter of oil in the future.

In short, I do not believe the U.S. will preferentially get increased energy from Canada for money alone. Certainly not long term, since better alternatives are available.

If Canadian provincial, federal and business support is to be attained, then the U.S. must offer more than money. It could offer to open its markets to selective, upgraded products, primarily those derived directly from natural gas, so that jobs are created in Canada and balance of payments are positively impacted. To this end, the Premier of Alberta has proposed bilateral duty-free access for a limited list of chemicals in return for increased exports of natural gas. This list included polyvinyl choloride, polyethylene, ethylene oxide, ethylene glycol, vinyl chloride monomer, styrene, methanol, phenol, maleic anhydride, pthalic anhydride and pentaerythritol.

A further refinement would be to allow duty-free access to U.S. markets for an amount of this list of upgraded hydrocarbons equal to a percentage of the natural gas exported by Canada to the U.S. Mr. Mort will have more to say along these lines. Reactions to forays on trades, etc., etc. have given the impression that the U.S. feels Canada has no alternative and that it must sell its hydrocarbons to the U.S. I assure you this is not the case in Canada or in Mexico. If the U.S. wants energy and hydrocarbons from Canada and Mexico, it should capitalize on the remainder of its reservoir of friendship and respect and offer that which your Northern and Southern neighbors need—jobs for their citizens and a portion of the upgraded manufacturing facilities that will supply U.S. markets.

From the point of view of Canadians, the export of oil and gas is not just the export of a key resource—it is also the export of jobs. I believe Canadians would be receptive to overtures based on benefits to both countries and not just the U.S. I sincerely hope you can make it possible for your friends to the North to preferentially want to export additional energy supplies to the U.S. Please remember that all 1,000 mile journeys are accomplished one step at a time—and nothing at all happens until the first step is taken. Selective free trade for a limited number of petrochemicals with increased Canadian national gas exports could be that first step.

Thank you for inviting me.

[Thereupon, at 12:30 p.m., the subcommittee recessed, to reconvene at the call of the Chair.]

○