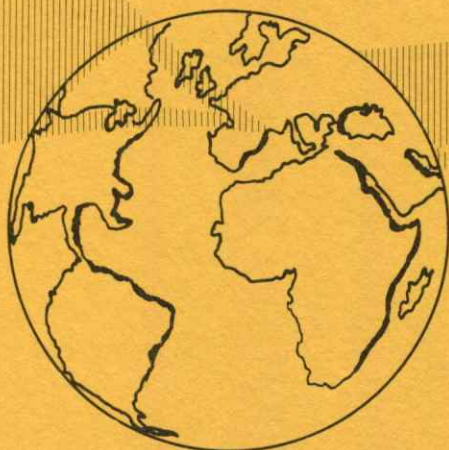


THE WORLD PETROLEUM INDUSTRY
and
ITS IMPACT ON MID-CONTINENT
Oil and GAS ECONOMICS

BY **CHARLES A. HELLER**



APRIL 69

SPECIAL DISTRIBUTION NUMBER **44**

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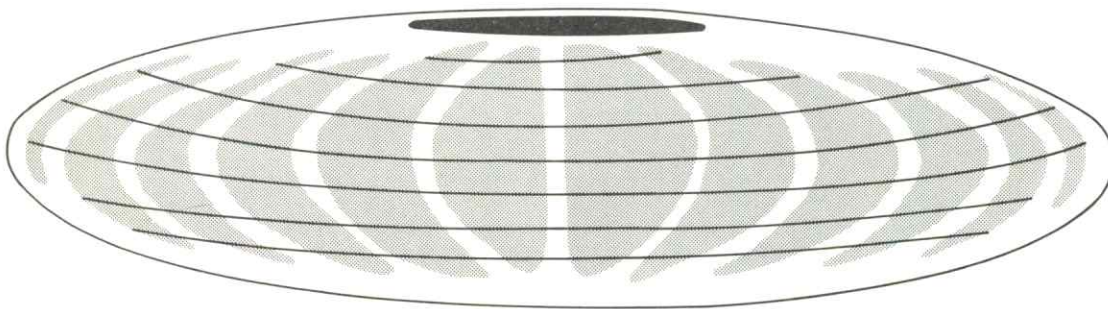
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The World Petroleum Industry and Its Impact on Mid-Continent Oil & Gas Economics

By Charles A. Heller



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Editor's Remarks

On January 7 and 8, 1969, Dr. Charles A. Heller presented two lectures on "The World Petroleum Industry and Its Impact on Mid-Continent Oil and Gas Economics" to a group of industry representatives, state and federal agency representatives, and university faculty members and staff. Dr. Heller was invited to prepare these lectures by the Kansas Geological Survey, and was sponsored by the Kansas Geological Survey and the Department of Economics at Wichita State University.

Dr. Heller, who holds the doctorate degree from the University of Vienna and entered the petroleum industry in Austria in 1913, has held management positions in the petroleum industry and banking for nearly 50 years. He has had broad international experience, and since retirement has devoted his attention to study of the economic and political problems of the international oil industry.

In 1963, Dr. Heller was appointed a member of the "Commission of Inquiry into the Oil Industry" by the Governor General of Trinidad and Tobago, and in 1965 was appointed chairman of the Petroleum Marketing Commission in the same area. He is a consultant to the United Nations and has prepared a study on "Petroleum Refining in Developing Countries," which will be published during 1969. He was a lecturer before Inter-Regional United Nations Seminars on Petroleum Affairs in New York in 1962 and in Port of Spain, Trinidad, in 1968. He lectured before the Institute of Petroleum in London, and in Belgium, France, and Trinidad and Tobago. For several years he has been a Guest Professor at the Post Graduate Petroleum School, Scuola Enrico Mattei in San Donato Milanese in Italy.

He is an editor for Economics and United Nations Affairs for the World Petroleum Magazine of New York and is a member of the American Petroleum Institute and the Institute of Petroleum in London.

Dr. Heller's knowledge of the international petroleum industry is comprehensive, and his understanding of the relationship of that industry to the petroleum industry of the United States is perceptive. Furthermore, his insight has led to some intriguing recommendations for maintaining the vitality of the petroleum industry in the United States. In order that his understanding and insight may be shared with a larger audience than could attend the lectures, the Kansas Geological Survey has published the transcript of these lectures in the public interest. We hope that they will generate wide discussion of the alternatives and options available to government and industry in establishing policy that will influence the growth and development of the petroleum industry in the United States.

William W. Hambleton
Associate Director

THE WORLD PETROLEUM INDUSTRY AND
ITS IMPACT ON MID-CONTINENT OIL AND GAS ECONOMICS

by
Charles A. Heller

GEOGRAPHY AND INSTITUTIONAL STRUCTURE OF
THE INTERNATIONAL OIL INDUSTRY

This seminar deals with interactions between events in the petroleum industry on the outside and inside of our country. These events have created complex issues for the United States petroleum industry, including both oil and natural gas, and require review of our entire energy policy for the future. The problems have been described and discussed by our own and foreign governments, by inter-governmental institutions, by private, national, and international organizations, and by leaders of our industry and learned students of political and economic events. It is, therefore, quite an undertaking for an old oil practitioner to present the facts as I see them, and to outline conclusions of interest to the Mid-Continent petroleum industry. Landlocked states like Kansas, one of the oldest oil-producing states in the Union and possessing one of the largest gas fields in the world, feel particularly the impact of the interactions which will be discussed in this seminar.

We will deal first with facts and figures which reveal the international scene today and are background for later discussion of the "interaction between the outside and the inside."

Some Petroleum Geography

At the end of World War I, the international crude-oil supply pattern was based mainly on production in the Americas; the pattern was monocentric. However, by 1909 the coming disturbance in this monocentric system had been heralded by the discovery of oil in commercial quantities in Iran by d'Arcy, the British explorer. The years between the two world wars saw important discoveries on the Arabian peninsula. The strike at the Iraq Petroleum Company well, Baba Grugur No. 1, north of Kirkuk "altered the oil history of the world." The monocentric system was displaced by a multicentric system, and the United States changed its role from

an oil exporter to an oil importer.

We shall look first at petroleum geography as it is determined by nature, and look later at "man-made" geography. World crude-oil production in 1968 reached 38.5 million barrels per day, of which the Communist countries produced 6.7 million barrels and the Free World, 31.8 million barrels. Five main producing areas dominate the multicentric system; these include the Middle East, the United States and Canada, the U.S.S.R., Africa, and the Caribbean. The historical development of these five areas is shown in Figure 1, which summarizes world petroleum production during the period between 1950 and 1967.

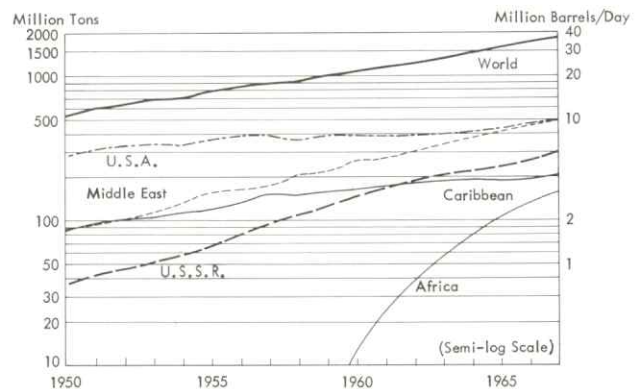


Figure 1. World oil production and production from principal producing areas, 1950-1967.

In 1968, production in these main areas is estimated as follows:

Middle East	11.3 million b/d
U.S.A. and Canada	10.2 million b/d
U.S.S.R.	6.2 million b/d
Africa	3.8 million b/d
Caribbean	3.7 million b/d

The Middle East, as a producing unit,

has overtaken North American production of 10.2 million barrels per day, of which the United States accounts for 9.2 million barrels (not including approximately 1.5 million barrels per day of gas-liquids). The U.S.S.R. retains third place. The upsurge of African production has continued, owing mostly to developments in Libya, and in spite of the closing of major producing fields in Nigeria.

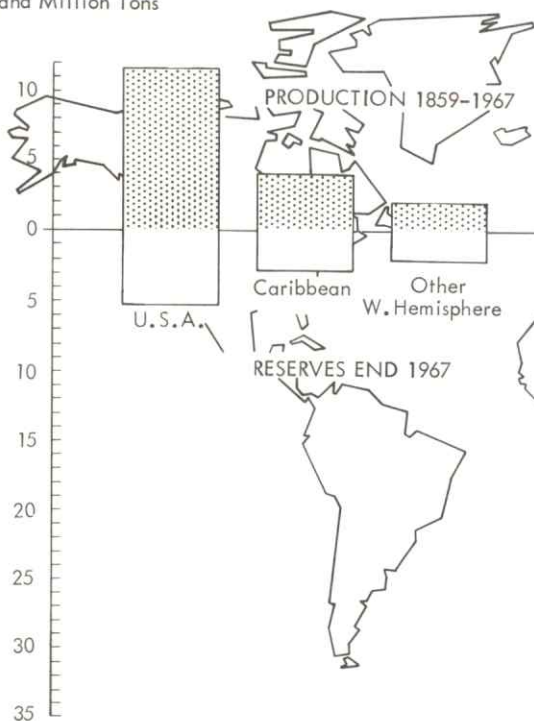
World proven and probable crude-oil reserves were estimated at 496 billion barrels at the end of 1967, of which 92 billion barrels were located in the Western Hemisphere and 404 billion barrels in the Eastern Hemisphere. Reserves were divided among the five main producing areas as follows:

Middle East	282 billion barrels
U.S.A. and Canada	57 billion barrels
U.S.S.R.	60 billion barrels
Africa	45 billion barrels
Caribbean	26 billion barrels

470 billion barrels

When we look at Figure 2, showing total discovered oil, we cannot deny

Thousand Million Tons



Courtesy: British Petroleum Company Ltd.

Figure 2. Total discovered oil for principal producing areas, including production from 1859 to 1967 and reserves at the end of 1967.

that the United States, even if Canadian reserves are included, finds itself in a precarious reserve position from the point of view of political and economic security. The discovery of oil on the Arctic Slope has, of course, added considerably to our reserves.

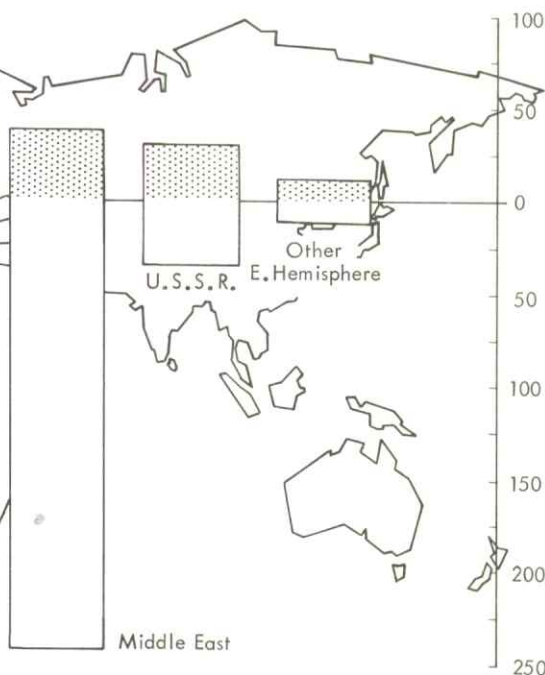
Natural gas reserves and natural gas production place the United States in a much more favorable position. Estimated proven natural gas reserves in billions of cubic feet at the end of 1967 are as follows:

United States	292,808
South America and West Indies	50,402
Western Europe	118,360
U.S.S.R.	150,000
North Africa	112,518
Middle East	228,237
Asia and Far East	33,015
Oceania	14,450
Others	72,060

Total World 1,071,850

It is estimated that actual world consumption of natural gas in 1968 reached 30 trillion cubic feet, which is the energy equivalent of approximately

Thousand Million Barrels



14 million barrels per day of oil. The United States consumed approximately 18 trillion cubic feet or 60 percent of the total; the Soviet Union consumed 5 trillion cubic feet or less than 20 percent. This picture will change, however, with increasing utilization of natural gas reserves in Western Europe, Africa, and new discoveries in the Adriatic Sea. Tremendous quantities of natural gas are still flared outside of the United States in many oil fields where associated gas is produced. Natural gas is probably the most wasted natural resource in the world.

Let us look now at man-made petroleum geography, which is influenced by technological developments relative to the movement of oil from production areas to centers of consumption. Included are international waterways, supertankers, overland pipelines, and location of refineries.

Oil usually is not found at or near places of consumption; Oklahoma City, Houston, and Los Angeles are exceptions. This situation is illustrated by facts from the international petroleum industry, as shown in Figure 3. In 1967, the main areas of oil deficiency included Western Europe, Japan, and to a lesser degree the United States;

whereas a tremendous oversupply was very evident in the Middle East, North and West Africa, and in the Caribbean.

This basic disequilibrium must be balanced by world oil movements on the high seas and on land. The past importance of the Suez Canal is very clearly seen in Figure 4, which shows oil movements by sea in 1966 before closure of the Canal at the time of the Arab-Israeli war of 1967. Figure 5 graphs the movement of oil from the Middle East to Western Europe and shows the before and after effect of closure on the Suez Canal.

There is little doubt that the international petroleum industry performed a supply and transport miracle during the emergency caused by the Arab-Israeli war. Western Europe requirements were met very rapidly by increasing shipments from the Caribbean and the United States, and by transport around the Cape of Good Hope from the Middle East. The United States contributed to this miracle by drawing upon reserve crude-oil productive capacity. However, the effort resulted in higher costs for the consumer.

Although reopening of the Suez Canal will contribute to the flow of Middle East crude oil to ports on the

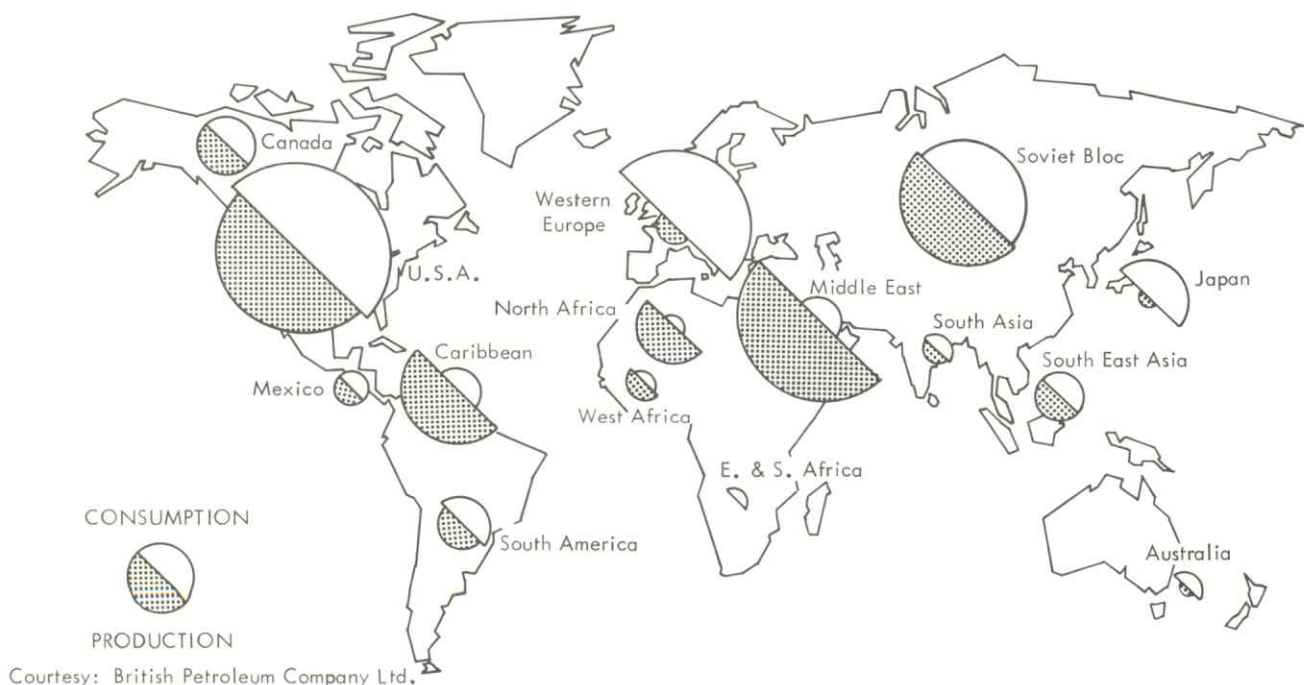
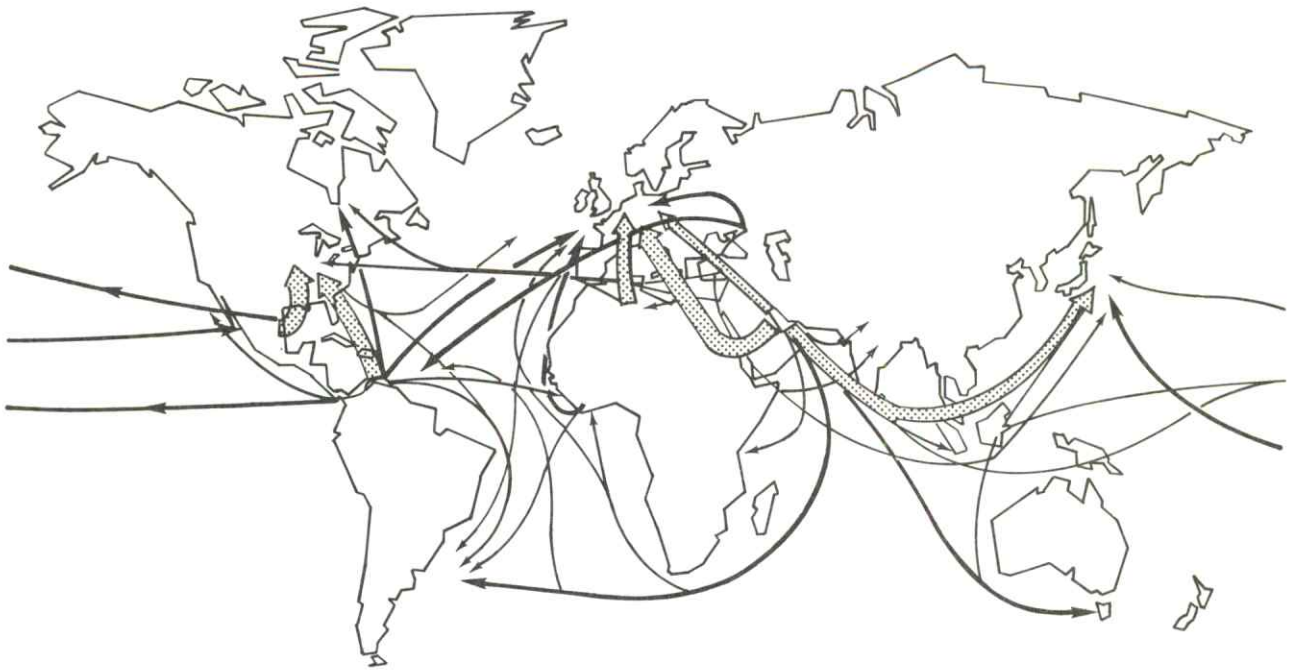


Figure 3. World oil production and consumption pattern, 1967.



Courtesy: British Petroleum Company Ltd.

Figure 4. Map showing main routes of oil movement by sea, 1966.

European coast of the Mediterranean, domination over oil movements by the Canal probably has ended forever. This shift in petroleum geography, caused by closing of the Canal, has been supported economically by very big tankers called VLCC's (Very Large Crude-oil Carriers) which had appeared at sea before the Middle East conflict. In 1966, one of the international American companies contracted for a fleet of tankers with a capacity in the 300,000 dwt class. The first of these behemoths, the Universe Ireland, started her regular runs in the fall of last year.

The world tanker fleet at the end of 1967 comprised 3,064 vessels with a combined tonnage of over 105 million dwt, not including vessels with a capacity below 10,000 dwt. In addition, 140 units with over 7 million dwt tons total capacity were in the fleet of so-called "combined carriers." At the end of 1967, a record number of nearly 300 ships totaling 40 million dwt were under construction. Increasingly, these vessels have a capacity of more than 200,000 dwt, and by the end of 1970, 20 percent of the entire tanker fleet will belong to this class.

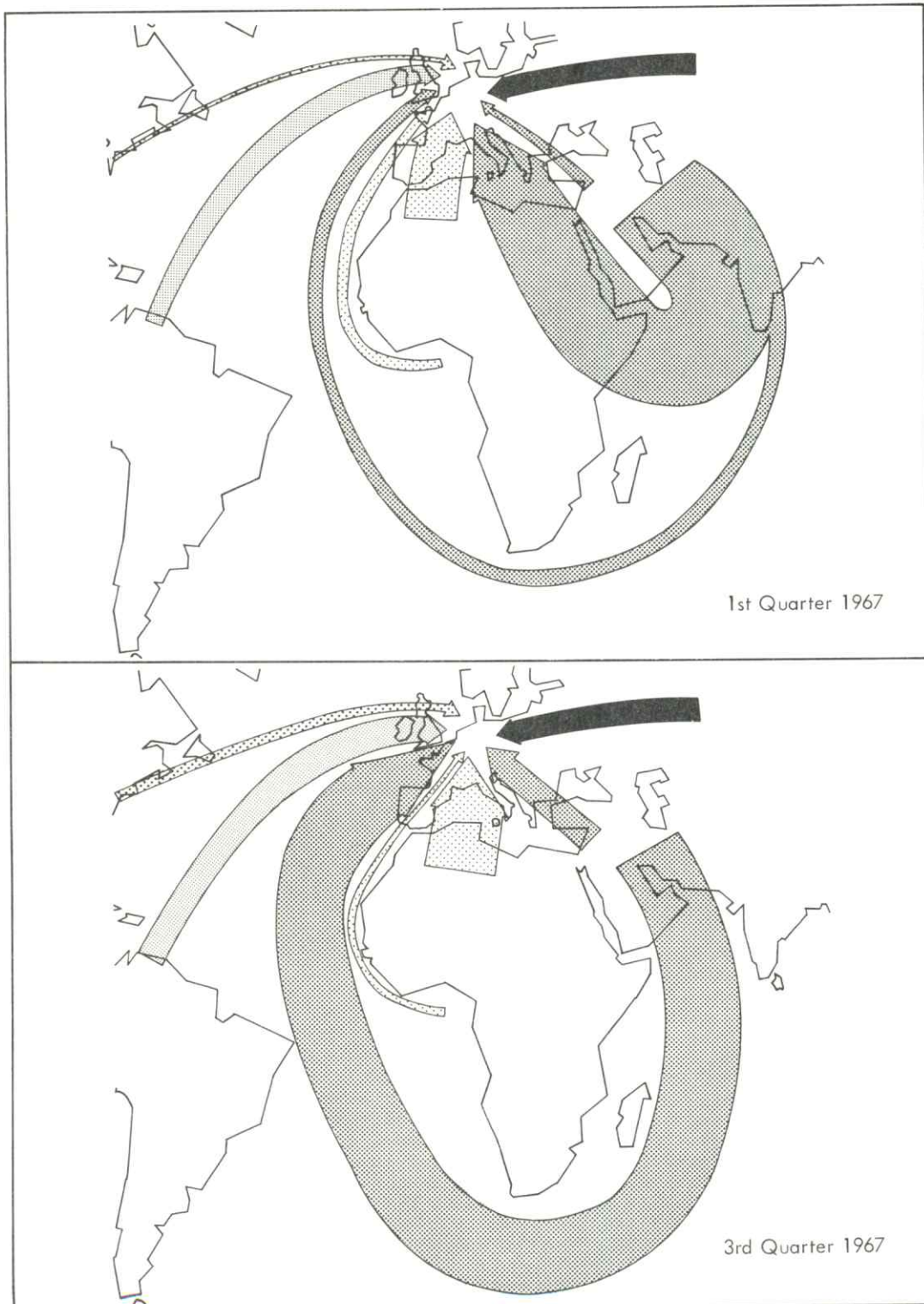
Construction and operation costs are much lower for these big vessels. A tanker of approximately 30,000 dwt capacity cost \$125 per ton to build in

1956. A VLCC of 200,000 dwt costs approximately \$67 per ton. This decrease in cost would be even more impressive if present costs were calculated in constant dollars at a 1956 value.

The cost of moving a ton of oil has been reduced considerably by the employment of these big vessels. If one were to use an index of 100 as a measure of the cost of moving oil in a 20,000 dwt tanker, during 1968 the index would be somewhat below 40 for a 75,000 ton vessel, and somewhat over 20 for a 200,000 ton vessel.

At the present time, there are no port facilities in the United States, on the European continent, or in the United Kingdom to receive vessels of the 300,000 ton class. Intermediate terminals must be constructed to arrange for reshipment to final destination in smaller vessels. Such a terminal is in operation on Bantry Island, south of Ireland. Transshipment in open waters, probably a temporary measure, has been executed with success in the North Sea. Transportation costs for the mammoth tankers are therefore increased by terminaling or transshipment costs.

We have heard of plans to build 500,000 ton bulk carriers, but many grave problems must be overcome before they can be used. Waterways like the



Courtesy: British Petroleum Company Ltd.

Figure 5. Maps showing routes of main oil movement by sea to Western Europe for the first quarter and the third quarter, 1967.

North Sea or the Strait of Malacca present shipping hazards. In addition, insurance for these tremendous ships and their cargoes could reach \$40 million, and might be difficult to place at the present insurance rates for large tankers.

The fleet for transportation of liquified gas also is growing steadily. The first vessel to transport bulk liquified gas, in this case LPG, was the Natalie Warren. The Methane Pioneer, the first carrier built for refrigerated natural gas, was constructed by an American consortium, reflecting American techniques in the development of natural gas carriers. Liquified gas is now transported regularly from Algeria to the United Kingdom and France, and from Libya to Italy. Preparations are underway for similar movements from African ports to Spain, and from Alaska to Japan. Projects are under study for gas shipments from the Caribbean to the East Coast of the United States, in competition with gas transported by pipeline from Texas to the East Coast. A small shipment of liquified gas arrived recently in Boston from Algeria!

Let us turn now to the overland movement of oil and gas by pipeline, another man-made factor of petroleum geography. Long-distance pipelines for crude oil connect the Middle East with the Mediterranean via the Tap-line from Saudi Arabia and the Iraq Petroleum Company line from the oilfields near Kirkuk. The center of European consumption is served by three crude-oil lines from the Mediterranean; one from Trieste to Ingolstadt (Bavaria) with a connection to Vienna under construction (Transalpine pipeline), the second from Genoa via Switzerland to Ingolstadt, and the third from La Mede (near Marseille) to France and West Germany, with a connecting line from Ingolstadt. Several lines run from German North Sea ports into the Ruhr. Pipelines for refined products are under construction from various points in Western Europe. Israel has a crude-oil line under construction leading from Elath on the Gulf of Aqaba to the Mediterranean that circumvents the Suez Canal, which will not be able to accommodate the VLCC's. A similar project is planned in the United Arab Republic.

The Soviet oil pipeline system already spans two continents. It is designed to transport crude oil from the old and new centers of production in the Caucasus, from the fields west and east

of the Ural Mountains, from locations in Siberia, and from the southern areas of the Asian territories of the U.S.S.R. to the consuming areas in the Soviet Union to the west and east. It leads also toward the Baltic Sea, approaches the borders of West Germany and Austria, serves the Eastern European satellites of the U.S.S.R., and goes to the Black Sea.

The Western European gas-line network, which is based on gas reserves in the Netherlands, interconnects with local lines in France, which has her own gas production at Laq, and in West Germany.

Austria connected to the ever-expanding gas pipeline network of the Soviet Union during the fall of 1968. The far-reaching concept behind this network is shown in Figure 6 which describes the U.S.S.R. gas pipeline system as of 1968. Attention should be directed to the gas line, scheduled for operation by 1970, which connects natural gas production in Iran with the Soviet gas-line network near Baku. Political and security risks cause doubt that Russian natural gas can move competitively into areas such as Italy.

Man-made petroleum geography and is dictated largely by changes which have occurred in refinery location. Before World War I, most large refineries were source-oriented, and located near or in direct local connection with crude oil producing areas. After World War I, a first generation of market-oriented refineries was erected in consuming areas. Security considerations and the necessity to save foreign currency through import of crude oil rather than refined products influenced the development which started in France. Other refineries were built at locations enroute between one or more sources of crude-oil supply and a number of markets. Such refineries are identified as intermediate or gateway refineries.

The resource-oriented share of the total capacity of Free World refineries outside of the United States and Canada declined from 69.8 percent in 1939 to 14.7 percent in 1967; it is estimated that this share will be further reduced to approximately 11.5 percent in 1970.

Market-oriented refineries increased their share of total capacity from 30.2 percent in 1939 to 78.1 percent in 1967. Intermediate or gateway refineries reached 7.2 percent of total capacity by mid-1967; this share is increasing.

By mid-1968, the Free World could record 697 refineries with a total crude distillation capacity of 36.4 million

barrels per day. This capacity, in million barrels per day, is divided as follows:

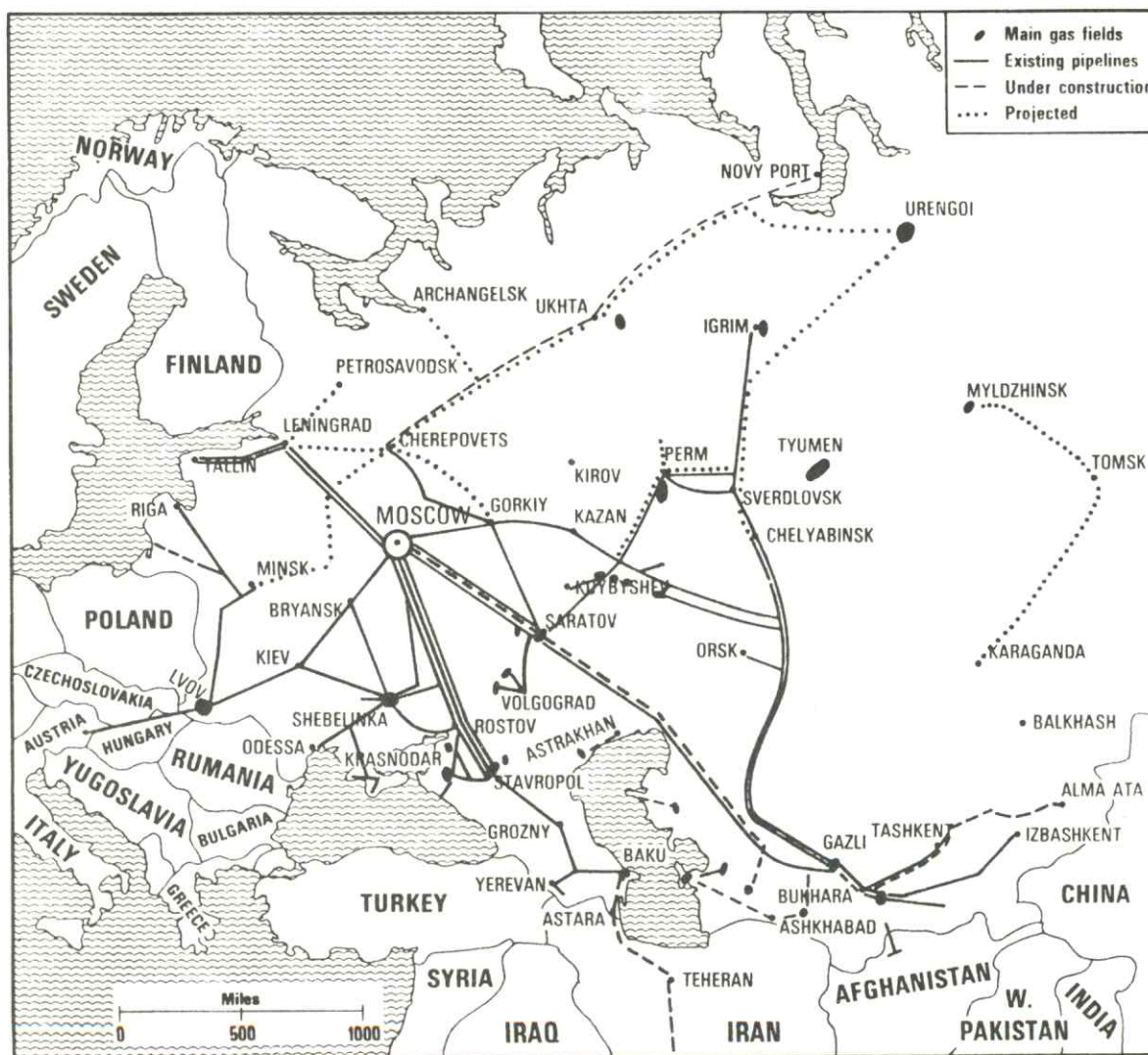
U.S.A.	11.6
Canada	1.2
Mexico	<u>0.5</u>

W. Europe	10.9
Middle East	2.1
Africa	0.7
Asia-Far East	<u>5.3</u>

North America	13.3
South America	<u>4.1</u>
Western Hemisphere	17.4

Eastern Hemisphere	<u>19.0</u>
Total Free World	36.4
U.S.S.R. and Communist bloc (estimate)	<u>5.6</u>

Total World	42.0
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Courtesy: Shell International, London

Figure 6. Map showing location of principal gas pipelines in the U.S.S.R., 1968.

World refining capacity should grow to approximately 50 million barrels per day during 1971-72. The proposed free-trade zone refineries for processing foreign crude oil in the United States will be partly market-oriented, insofar as their products move into consumptive areas, and partly intermediate or gateway refineries, insofar as their products will be re-exported.

Institutional Structure of the International Petroleum Industry

The organizational and economic structure of the international petroleum industry has changed continuously since the end of World War II. These changes have taken place within the private sector, within the public sector at national and international levels, and at the interface between the public and private sectors.

The Private Sector

At the private sector level, an integrated oil company retains much of the character of the old Rockefeller concept. Translated into modern terms, this means that the integrated company's interest "goes from the oil well to the last motorist and fuel oil consumer." International integration is complete once the brandname of a company has become a household word, and its trademark a familiar sign to everybody in a major part of the Free World.

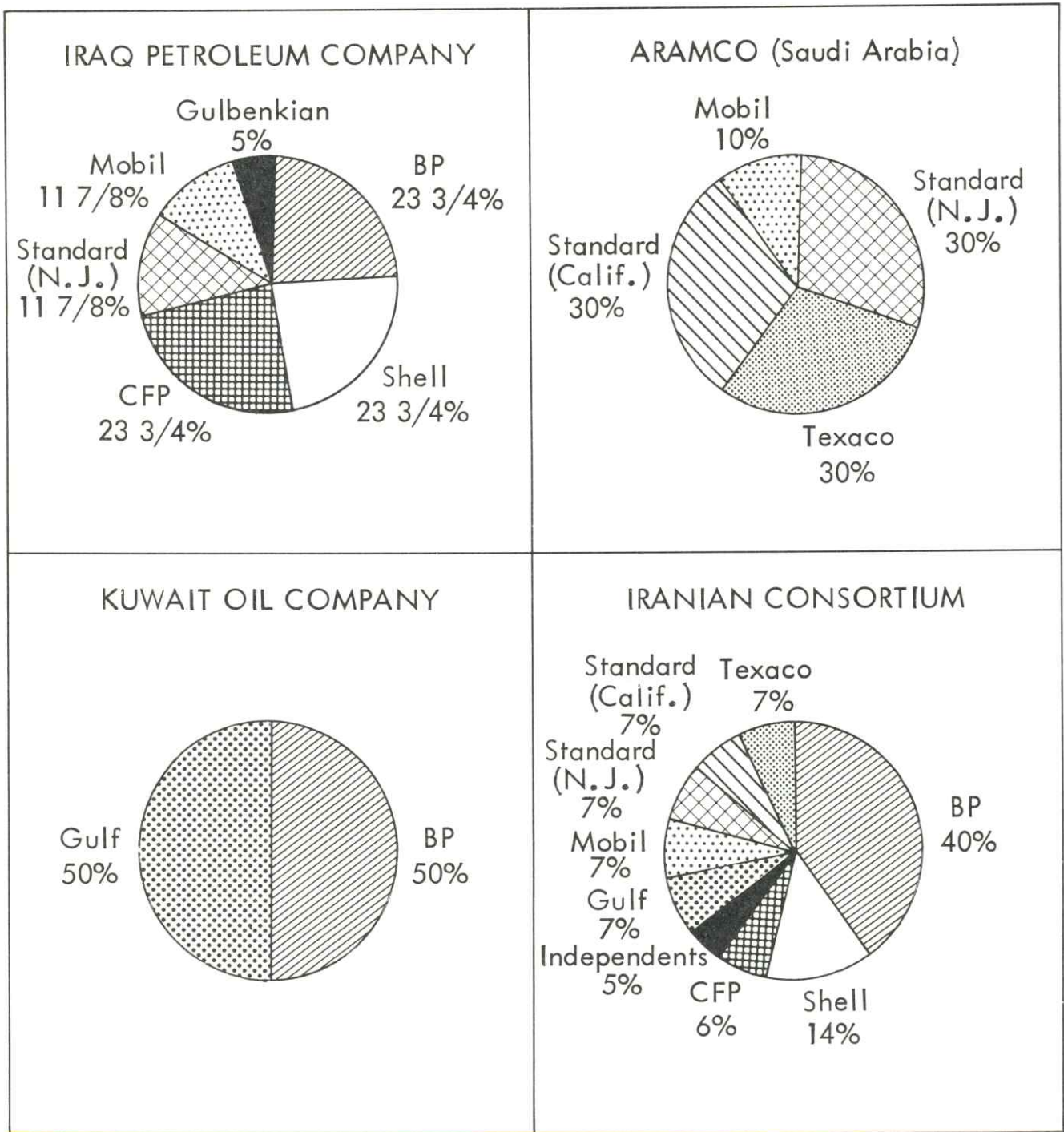
After World War II, this kind of international integration was achieved by seven companies, five of them American. The American companies included Standard Oil Company of New Jersey (known as Esso Standard), Mobil Oil Company, Texaco Inc., Gulf Oil Company, and Standard Oil Company of California. The others were the Royal Dutch/Shell group of companies and British Petroleum Company in Europe. These seven traditionally international companies were joined by the Cie. Francaise des Petroles, which obtained the French share of Iraq Petroleum Company from the French government in the 1920's.

A number of interlocking owner and partnership relations exist between these eight companies in the Middle East. Some of the details concerning the individual company shares in these arrangements are shown in Figure 7. Five companies hold 95 percent of the shares of the Iraq Petroleum Company; two of them own Kuwait Oil Company; and four of the American companies are share-

holders in the Arabian American Oil Company (ARAMCO) operating in Saudi Arabia. All eight major companies participate in the so-called Iranian Consortium, which took over the operation of the Anglo-Iranian Oil Company (now British Petroleum Company) in 1954 after it had been nationalized during the Mossadegh regime. A syndicate of several independent American oil companies has a combined share of 5 percent in the Consortium. Gulf Oil Company and the Royal Dutch/Shell group concluded an agreement in 1947, now extended into the 21st Century, which creates a kind of partnership for production and distribution of a great part of Gulf's share of Kuwait oil in the Kuwait Oil Company.

In 1955, these eight international major companies controlled 92 percent of world crude-oil production and 81 percent of refining capacity outside of the United States, Canada, and the Communist countries. After the Suez crisis of 1956-57, many newcomers appeared on the international scene, attracted by the alluring prospect of acquiring low-cost oil reserves. These newcomers are sometimes called independents in order to distinguish them from the eight other traditional international companies. In the United States, the term "independent" is used in a quite different sense to identify all operators outside the group of major oil companies. The international independents came from many nations, including France, Italy, Great Britain, Japan, and others, as well as from the United States. Sometimes they operated with miraculous success in old and new oil countries, ranging from the Iranian offshore sector in the Persian (Arabian) Gulf to the so-called neutral zone between Kuwait and Saudi Arabia, and in Abu Dhabi, the United Arab Republic, Nigeria, and over to the Sahara and Libya. The history of Libya, as an oil country, is probably one of the most interesting stories of our time. The independents also were active in discoveries of natural gas in the North Sea, off the coasts of the United Kingdom and Norway.

The problems of the independent have been formidable for he had to secure for his oil a share of the international market commensurate with his productive capacity. Integration is the one and only method of gaining permanently such a market share. The independent, therefore, has had to create or expand his own downstream



From: THE ECONOMIST (London)
 March 2, 1968

Figure 7. Some interlocking interests of the major international oil companies.

facilities such as transport, refining, and marketing. The eight major international companies moved over to make room for the new competitors. Consequently, the international companies' share of Free World crude-oil production (exclusive of the United States and Canada) declined to 75 percent, and refining capacity declined to 56 percent. The downward trend continued during 1967 and 1968 and probably will continue to decline during the foreseeable future.

The Public Sector

The first state oil enterprise was established by the imperial government of Austria before 1910. Flush crude-oil production, discovered north of the Carpathian Mountains in the Polish province of the realm, threatened to ruin many individual producers who could not dispose of their production in European markets, because the limited demand was dominated by the Standard Oil Company and the Royal Dutch group. The Austrian government decided to construct a topping plant near the center of this flush production to supply the State railroad with fuel oil as a replacement for coal.

A more important step toward governmental participation was taken by the British government in 1914, just a few months before the outbreak of World War I, when it acquired a major interest in the then Anglo-Persian Oil Company. This company had developed d'Arcy's discovery of oil in Persia and operated a huge export refinery at Abadan. This decision was made to assure a supply of bunker fuel for the British Royal Navy, which had switched from coal to residual fuel a few years before. The British government declared repeatedly that it would not exercise influence with the board of directors of the company, now known as the British Petroleum Company, except in the case of state emergency. The company is, therefore, managed like any other privately-owned corporation, except that the government is represented on the board of directors.

In contrast to the specific status of the British Petroleum Company, many state petroleum enterprises which are controlled by the government through direct public ownership or by holding a majority of the stock are destined to serve as instruments of government petroleum policy. Nearly 100 of these state petroleum enterprises are found in more than 60 countries of the Free World. Some of these companies take the form of complete state petroleum

monopolies as in Mexico, our neighbor to the south. Others are partial monopolies as in Brazil, Uruguay, Argentina, and the United Arab Republic. Some operate in certain sectors of the industry such as exploration, production, refining, marketing, or transport, or in combination of two or more of these sectors. In some countries, the state enterprise is the recipient of a "nationalized" local oil operation.

In this discussion, we shall devote our attention to two of the main types of these many state enterprises in order to show their importance in international oil operations. Our attention will be focused on those companies in large oil-producing countries, and those operating in large oil-consuming European countries.

The large national oil companies in oil-producing countries are not just landlords who leave the risks of exploration and production to concessionaires. They behave as entrepreneurs, and attempt to maximize national income from the natural resources of the country. In order to achieve this goal, they must integrate forward from the oil well to the marketplace like any privately-owned company. Backed by large crude-oil production, they may develop into major integrated oil companies in the future.

The National Iranian Oil Company (NIOC) was created in 1952 when the oil industry in Iran was nationalized during the regime of Mossadegh. The entire hydrocarbon wealth of the nation was vested permanently in the state enterprise, the first to be established in a producing country in the Middle East. An agreement in 1954 established a time-limited partnership between NIOC and the Iranian Consortium for operation of the nationalized properties of British Petroleum Company.

The means by which national companies gain direct access and a foothold in the international markets are different. The National Iranian Oil Company concluded a number of barter agreements for supply of crude oil against delivery of refinery equipment, pipe, and other industrial equipment with Eastern European Communist countries. The Kuwait National Petroleum Company constructed a large, sophisticated refinery in Kuwait, the first resource-oriented refinery built in many years, and invaded the products market in Western Europe and Asia. Construction of refineries in market areas is now being planned by the company.

Ahmed Zaki Yamani, Minister of

Petroleum and Mineral Resources of Saudi Arabia, last summer demanded a share in the equities of concessionaires, including downstream operations. This request has been rejected recently by the Chairman of the Board of Esso Standard.

The entrance of these national petroleum companies into marketing leads to a double collision course: (a) with the private sector of the industry which now controls a great part of distribution and marketing facilities in international trade, and (b) between state enterprises which sooner or later will be pitted against each other in the international market. Clearly, this kind of increase of technical market pressure cannot contribute to price stabilization.

The state enterprises of Italy and France are the most important in western consuming countries. The Ente Nazionale Italiana (ENI) is the brainchild of the late Enrico Mattei, one of the most interesting personalities in the post-war oil industry. Using the natural gas reserves of his company in upper Italy, together with ENI's refining capacity and growing marketing organization as an operative and financial base, he struck out against the international majors in sharp competition and action to gain a position in the international oil industry. To achieve this goal, Mattei required secure crude-oil supplies for his refineries in Italy from sources not controlled by the international majors. For this purpose, he took two decisive steps. He reopened Italy for substantial crude-oil imports from the Soviet Union, thus helping the Russians to gain, with one stroke, an important position in the world oil markets, and assured ENI of supplies at rather low prices. He then succeeded in promoting the first direct cooperation between state oil companies in producing and consuming countries by establishing a jointly-owned company with the National Iranian Oil Company for exploration in the Persian Gulf offshore area of Iran. This company is now productive. In order to meet his competitors and adversaries on another and rather sensitive battleground, Mattei induced a number of the newly-independent countries in Africa to construct small refineries that would make them independent of imports of refined petroleum products. The major oil companies traditionally had supplied these markets during colonial times. Mattei died in an airplane accident in 1962 and did not live to see his company operate in a completely

commercial fashion not only in Italy but in many other countries of the world.

The French state enterprise, called ERAP-ELF was created by General de Gaulle several years ago through the merger of a number of previously independently-operated state companies to serve as an instrument for his international policy. ERAP-ELF controls large production of natural gas in the Laq fields in southern France, has a 50 percent share in the big Hassi Messaoud oil field in the Sahara and in the gas field of Hassi R Mel, and oil production in Gabon, Canada, and other countries. A number of exploration contracts are being executed in Iran, Iraq, and Libya. The company and its subsidiaries have refining and marketing facilities in France and enjoy preferential treatment by the government. The company also has refinery and marketing interests in West Germany and in several African and other countries.

The Mixed Sector

The encounter between the private and public sectors generally has not been too friendly in the past, as we have seen in the ENI story. However, attitudes and philosophies have changed both sides during the last decades. Governments and private industry recognize, in many instances, that peaceful co-existence in the industry can serve the common purpose. Following the example of Enrico Mattei, a number of mixed joint ventures, as between the National Iranian Oil Company and various private companies, have been started for the exploration and production in the Persian Gulf. Similar arrangements have been developed in the United Arab Republic, in Saudi Arabia, and even for the North Sea. Standard of New Jersey and Shell, which discovered the gas reserves in Slochteren in the Netherlands, cooperate with the Dutch government through a mixed company for the distribution of the Dutch national gas production.

Finances

The total gross investments of the Free World in fixed assets in the oil industry, as reported by the Chase Manhattan Bank, amounted to \$166 billion at the end of 1967. Approximately \$83.8 billion, or somewhat more than 50 percent, were invested in the United States. Total net investments were \$91 billion, of which nearly 48 percent, or \$43 billion, were located in the United States.

Total net investments outside of the United States were \$48 billion, of which \$18.6 billion or approximately 38.7 percent represented investments by American companies. The Department of Commerce reported recently that earnings from direct investments abroad by American oil companies in 1967 were \$2,188 million of which \$1,986 million were remitted to the United States. The value of oil imports amounted to \$2,250 million, leaving a gap of some \$274 million, which probably is balanced by income in foreign exchange from supplies, services, consultation and other fees to subsidiaries of American oil companies abroad. The Department of Commerce also reported a capital outflow for new investments abroad during 1967 of approximately \$1,103 million. Capital outflow for 1968 has been reduced, owing to restriction on foreign investments. The earnings from foreign investments by the United States oil industry are an important contribution to our balance of payments, and decisions by the federal government should not neglect this fact.

Another important group of figures should be presented. Annual investments in all sectors of the petroleum industry plus uncapitalized expenditures for exploration in the Free World were \$16.8 billion in 1967. The share of the United States in this expenditure was \$8.3 billion, or nearly 50 percent. Of this total of \$16.8 billion, the funds destined for exploration and production were \$7.2 billion, of which \$4.6 billion or 65 percent was spent in the United States and only 35 percent or \$2.6 billion in the rest of the Free World. In its monthly report on the petroleum situation for November, 1968, the Chase Manhattan Bank inquired as to why the United States domestic industry requires such a large share of capital expenditure. This question is even more justified if one considers that our consumption of oil is less than the consumption of all other countries of the world together and that we import 20 percent of our oil requirements. One might conclude that too much money is spent in the United States for acquisition of proven reserves, for excessively high bonus payments to government for offshore exploration rights or leases, or for drilling to gain from additional exploration allowables. This question deserves serious consideration, for in the next 10 or 15 years world production must double to 80 million barrels per day. Domestic crude-oil production is

estimated to grow to 18 million barrels per day by 1980, with imports increasing at a commensurate rate.

In a lecture before the United Nations Inter-Regional Seminar on Petroleum Administration, which was held in Trinidad last spring, I estimated that total capital requirements of the oil industry in the Free World for a 10-year period (until 1977) would be between \$220 and \$250 billion based on an average consumption growth of 5 to 7 percent per year and without further decrease in the purchasing power of our currency. Assuming that the United States share of this total will decline to approximately 40 percent during the 10-year period, we must develop capital for expenditures of between \$90 and \$100 billion during the same period. Self-generated cash will contribute 70 to 75 percent of capital requirements. Will this be possible at today's petroleum prices, particularly in the producing sector of the industry? This decisive question will be reviewed more thoroughly in subsequent discussions.

INTERACTION BETWEEN INTERNATIONAL AND DOMESTIC OIL INDUSTRY

Domestic and foreign critics often charge that the American oil industry favors free trade outside of the United States, but welcomes all kinds of internal restrictions, such as control over crude-oil production by the member states of the Interstate Oil Compact Commission and mandatory petroleum import restrictions by the federal government. A free society and economy provide a most welcome ground for discussion of ideology and debate of the issues involved. Here, we will attempt to throw some light upon the conflict between happenings on the outside and those on the inside which relate to the future of our oil and energy supplies.

The United States has lost its previously undisputed leadership as the world's petroleum supplier. A generation gap has opened between the United States and most of the new producing countries; a gap in productivity and in production costs and prices. However, those within our country or on the outside who would think that our "oil muscles" are weakening are completely mistaken in spite of local signs of geriatrics.

Hydrocarbon reservoirs generally are subject to diminishing return and

to increasing production costs once the reservoir is defined and developed, both in area and depth. However, if oil is produced from reserves which are virtually inexhaustible during the lifetime of the producing rights, then the physical production costs often are incredibly low. Thus, the productibility of each oilfield and the method of lifting oil to the surface are decisive factors in influencing production costs. Conservation measures, taken to protect reservoirs, are an additional factor in the costs of production.

The average crude-oil production costs in the United States have been estimated at over \$2.50 per barrel, but this figure is misleading. On December 31, 1967, the United States had approximately 573,000 producing oil wells with an average production of 15.2 barrels per day. However, the overwhelming majority of these wells, approximately 376,000, showed an average production of 3.63 barrels per day. The remaining 197,000 wells showed an average production of 37.7 barrels per day. More correct information regarding production costs in the United States was given last spring by A. R. Nielsen, President of Mobil Oil of Canada, who reported a total cost of \$1.68 per barrel, including cost of exploration, development, overhead and physical production. In all probability, the effect of stripper wells has been eliminated in computing the Nielsen figure. Production costs in Canada have been estimated at 87 cents per barrel.

If one accepts the more pessimistic average of \$2.50 per barrel, then production costs in the United States are over 40 times higher than in Kuwait where costs are estimated at 6 cents per barrel, including delivery to deep-water terminals, 30 times higher than in Saudi Arabia where the cost is approximately 8 cents per barrel, 20 times higher than in Iran, and even 4 times higher than in Venezuela where the cost is 60 cents per barrel. Furthermore, the sins of the American oil youth are still being paid, for the East Texas field has 26,000 prorated wells, whereas the Abqaiq field of similar magnitude and extension in Saudi Arabia is uninitialized with 62 wells.

Average production cost in the Middle East is estimated at 12 cents per barrel. However, to these production costs one must add the "take" of the host government in royalties, income tax, and shared profits, which averaged approximately 82 cents in 1967.

One thus arrives at an average cost of 94 cents per barrel for Middle East crude oil delivered to the terminal, and this cost is rising gradually. In some of the more recent joint ventures in Saudi Arabia, the government share is as high as 93.48 cents per barrel.

Concessionaires look with great misgiving upon the continuously increasing demands of the host countries, because these demands cut deeply into the self-generating cash potential. One can look at this cost quite differently from the environment of a landlocked oil-producing area in the United States because the host country's take narrows the gap between the cost of foreign crude oil and our own high-cost, domestic crude oil.

That the economic law of price determined by cheapest production is not fully operative in the international oil trade is regarded as an unhealthy anomaly by some economists. On one side, the economic law is distorted and broken by considerations of military and economic security, and on the other by political and business power positions at international and local levels. A cartell-like understanding was reached in 1928 between leading American, British, and Dutch petroleum interests. This so-called "As Is" agreement of Achnacarry recognized the relative standing of the participants in world oil trade. Whatever traces of the "As Is" agreement survived World War II were eliminated soon afterward.

Until 1949, world market prices were ruled by Gulf Coast quotations in the United States. The point of equalization for delivered prices was the United Kingdom. This means that crude oil or refined products delivered from the Caribbean or from the Middle East were priced at the point of equalization as if they had originated from the United States Gulf Coast. This price structure changed in 1949 when the United States government agency in charge of Marshall Plan administration insisted on cheaper prices for delivery of petroleum to Western Europe. By September of that year, the point of equalization between the Caribbean and the Middle East was set at the Eastern Seaboard of the United States, which had ceased to be a petroleum exporting country. Middle East prices, accordingly, were adjusted downward.

When the parity price of United States Gulf Coast plus ended in 1949, the world oil trade shifted to postings in the main export areas that dominated

large oil movements in international trade. Middle East prices were posted for the first time in 1950 when Socony (now Mobil Oil Company) announced prices for several shipping points in the Persian Gulf. This shift to postings was linked with the first basic agreements between the oil companies and the Middle East host countries for equal share in the profits of oil operations in the respective countries.

Before continuing with the analysis of price developments since the beginning of the 1950's, one should clarify an intriguing problem of semantics. Posted prices in the United States were and are prices offered by the buyers of crude oil, which are the pipeline companies serving a well or an oilfield. However, posted prices for crude oil and refined products traded from sources outside of the United States are published by the sellers who are the principal suppliers in the respective export areas, such as the Middle East, Africa, the Caribbean, and Singapore.

For the first part of the 1950's, the petroleum market, particularly in the Middle East, was an oligopoly of relatively few sellers. During the first Suez crisis of 1956-57, prices in producing areas that were unaffected by the closure of the Canal, such as the Caribbean and the United States, experienced a short-lived price upsurge and reopened some reserve capacity. The price of 36 API crude oil in Kansas rose to \$3.07, but dropped to \$2.97 once the Canal reopened in the spring of 1957 (price for this oil is now \$3.12). After the reopening of the Suez Canal, a number of coinciding events contributed to a complete reversal in the general structure of international petroleum markets. First, new and prolific oilfields were discovered and developed in the Middle East, Venezuela, the Sahara, and later in Libya. A great number of discoveries of lesser importance were made in various parts of the world. The fact that several of the crude-oil producers (new and old) lacked adequate downstream facilities of their own increased the impact of the overproductivity in the world on the markets. Secondly, the Soviet Union reentered the petroleum markets of the Free World after a pause of nearly 20 years, and sold low-cost oil to Italy and other countries. Finally, the United States reintroduced voluntary oil import regulations in 1957, which became mandatory in 1959, thus restricting free access to the single largest market in the world.

The pre-Suez seller's market was replaced by a buyer's market and fierce competition engulfed international oil trading.

The imbalance between supply and demand caused an endemic price disease which became virulent in 1959, as crude-oil producers in Venezuela lowered postings for Oficina (31 API) from \$2.80 to \$2.55 in April of that year. Iranian light crude (34 API) dropped from \$1.99 to \$1.73; Saudi Arabian crude (36 API) declined from \$2.12 to \$1.85; and Kuwait crude (31 API) was reduced from \$1.85 to \$1.59. All of these price reductions took place between April, 1959, and August, 1960.

This break in prices caused great concern in Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela, the five main oil-exporting countries. In 1960, they established the Organization of Petroleum Exporting Countries (OPEC) to devise ways and means to stabilize prices in the international oil market and to improve their income. This organization subsequently was joined by Abu Dhabi, Indonesia, Libya and Qatar. OPEC, which had been recognized as an inter-governmental organization by the United Nations in 1965, could not correct the imbalance between production and demand, and the competition between the growing number of suppliers drove the price level even lower after 1960. The host countries protested vehemently against any further decrease of posted prices, but price discounting and other sales gimmicks became the usual practice.

For better understanding of the influence of the outside industry on the inside industry, a short excursion into price semantics should be made at this point. The realities of the international oil trade are represented today by discounted prices, also called third-party prices, which are stipulated in arm-length transactions between sellers and buyers who are neither affiliated with each other nor belong to the same group of internationally integrated companies. Discounted prices are pegged either in a monetary unit, or at a percentage below posted prices. Transfer prices are charged for oil purchased by one affiliated unit of an integrated company from another member of the same company. Transfer prices have great influences on the economics of the entire oil industry in the Free World, including our domestic industry, because they represent the major part in volume and value of all sales and purchase transactions for crude oil and products in the world petroleum industry.

If and when the transactions straddle the tax sovereignty of two or more countries, tax-reference prices may be established by the affected governments, or they might be agreed upon between a government and the operators to establish the taxable value of oil and gas sold in international trade. In most OPEC countries in the Middle East and Africa, the posted prices now are, more or less, the same as tax-reference prices. In Venezuela an agreement between the government and the oil companies settled the issue of tax-reference prices on a rising scale basis until the early 1970's.

Official and regular information on discounted prices for crude oil and refined products is generally not available, except in cases of public tenders.

However, prices are known to the trade. Based on information obtained from reliable trade sources, one can estimate that during 1968, after the consequences of the Arab-Israeli war had subsided, discounts from posted prices for crude oil ran between 20 and 35 percent, and discounts for most refined products between 15 and 25 percent. The magnitude of the discount depends upon volume, type, and location of the crude oil or product, and local, individual market conditions.

Inasmuch as the interaction between the outside and the inside is exclusively dominated by discounted prices, it is interesting to list a few unconfirmed indications of discounted prices based on armlength transactions.

Crude oil: all prices per barrel in U.S. dollars, API-Gravity:

<u>Source:</u>	<u>Type:</u>	<u>Fob:</u>	<u>Posted:</u>	<u>Discounted:</u>
Venezuela	Tia Juana Medium	Amuay	\$ 2.30	\$ 1.75
	26 - 26.9			
Kuwait	31 - 31.9	Mena al Ahmadi	1.58	1.25
Saudi Arabia	27 - 27.9	Ras Tanura	1.47	1.10
Iran	light 34 - 34.9	Kharg Island	1.79	1.31
Iran	heavy 31 - 31.9	Kharg Island	1.63	1.28
Libya*	39 - 39.9	Brega	2.21	1.90

*Markets for Libyan crude are favored by the closure of the Suez Canal.

Refined products: prices per U.S. gallon for bulk shipments fob Netherland West Indies. Posted prices given for second half of November 1968 in U.S. dollars:

	<u>Posted:</u>	<u>Discounted:</u>
Gasoline 100RM	\$0.112	\$0.090
Gasoline 95RM	0.097	0.080
Kerosine	0.089	0.075
Dieseloil 48/52	0.075	0.070
Fueloil No. 2	0.073	0.069
Residual fueloil per barrel	2.000	1.35 to 1.40 depend- on sulphur limit

During the Suez crisis of 1956-57, it became evident that the shut-in, crude-oil capacity of the United States served as a protective reserve for emergency oil requirements, not only for our country, but also for our allies and other friendly nations. This condition was true even though the United States had ceased to be an export country for crude oil and the main petroleum products.

However, we would distort history to deny that not only political but also economical security considerations were involved when the Eisenhower Administration in 1957 first introduced "voluntary" import quotas which were followed by the proclamation of March 10, 1959, placing all oil imports under mandatory restrictions. This proclamation was issued under the National Security Clause of the Trade Agreements Act.

Although our foreign policy called for trade liberalization, oil imports were limited. That the political security considerations of 1959 were justified has been proved during and after the Arab-Israeli war of 1957 when the United States was called upon to deliver emergency shipments of crude oil and products to Western Europe.

Some light should be thrown on the economic security question. In 1959, both our high-cost crude-oil production and our domestic refining industry were in economic danger, along with our coal mines, as suppliers of energy to eastern sectors of the United States. We forget that, owing to weakening of international oil prices and lower tanker rates, the price shed for foreign oil extended as far inland as Pittsburgh. The mandatory oil import controls of 1959 established a kind of economic petroleum fortress in the United States. The keys to this fortress are exclusively in the hands of the federal government. The wider the gap between the cost of oil outside of the fortress and inside, which economists would call "economic rent," the stronger became the pressure on both sides of the protective walls of the fortress. As this pressure grew stronger, efforts to punch holes in the protective walls or to circumvent the ramparts became more successful, and our own production position became more difficult.

How big is this gap today? A few estimates of the cost of foreign crude oil delivered to the East Coast of the United States will provide an illustration. These estimates are based on discounted prices and the presently

prevailing tanker rates for large-sized vessels.

		<u>per barrel</u>
Tia Juana (Venezuela)		
Medium--26-26.9 API	fob Amuay	\$1.75
Freight - insurance		<u>0.25</u>
	cif	\$2.00*
Libya 39-39.9 API	fob Brega	\$1.90
Freight - insurance		<u>0.45</u>
	cif	\$2.35*

*Figures are rough estimates, not considering excise tax of \$0.10 per barrel.

It is the peculiarity of restrictive economic measures, irrespective of whether they emanate from government action or from a private "cartell," that a new value is born. This value represents the benefit accruing from a quota, such as an allowance for crude-oil production, an import or export permit granted by government, or a cartell quota for the production of raw material, manufacturing of goods and their distribution. After a certain time, such quotas tend to become a kind of "vested" right, and generally are defented with all possible vigor. Management sometimes seems less devoted to maximization of operational efficiency than to the drive for a "quota."

During the last few years, for example, all kinds of schemes were devised to obtain a "quota" or some privilege for importation of crude oil or products. The independent refiner in the Mid-Continent, who may be able to purchase low-cost foreign crude oil within his import quota, is entitled by import regulations to exchange his import quota against domestic crude oil delivered to his plant. The exchange is made with a coastal refiner. The monetary value represented by this barter arrangement is, in reality, the price for his "import ticket." The value of the ticket depends on the discounted price for the foreign crude oil, tanker rates, transportation costs to the coastal refineries, and the actual cost of domestic crude oil delivered to the holder of the ticket. Another element to be considered is supply and demand for the ticket. Before the Suez crisis of 1967, a ticket for Districts 1 and 4 had a

going price of \$1.25. During the crisis and in the months immediately afterward, higher tanker rates, particularly from the Middle East, increased the import price of crude oil. Accordingly, tickets remained unused, but the import quotas they represented remained valid and their use was extended. In addition, new "import tickets" were granted to the petrochemical industry. This oversupply of available tickets caused the value of the tickets to drop to approximately 70 cents per barrel during 1968. The value of 1969 tickets increased to approximately \$1.25 for refineries in Districts 1 to 4.

Imports to District 5, which includes Alaska, Arizona, California, Hawaii, Nevada, Oregon, and Washington, had been regulated by the Eisenhower proclamation of 1959 in a different manner from imports to Districts 1 to 4. The import quotas of the refineries in District 5 are calculated in such a manner that the ticket value is lower, whereas the financial effect is somewhat higher than in all other areas of the United States.

Finally, import regulations are so administered that they tend to operate in the direction of an international division of effort between the outside and the inside. Technical reorientation of the United States refining industry during the last 10 years has increased the yield of high-value refinery products and minimized the output of low-value products. Without this division of effort, the energy needs of the northeastern part of the United States would be impossible to satisfy at the present price level.

We cannot conclude this short review of the economic interactions between the outside and the inside without examining the influence of Canada and the Arctic Slope of Alaska. Canada, in the general terms of this analysis, straddles the borderline between the inside and the outside. During 1967, an average of 410,000 barrels per day from Canadian crude-oil production of over 1 million barrels per day moved via pipeline to United States refineries on the West Coast and the northern tier of states. Crude-oil imports from Canada are exempted from the general import quota system, but an understanding has been reached between the two governments concerning the overall volume of oil movement. Refined products are shipped from the United States refineries to certain parts of eastern Canada which otherwise are supplied with foreign

crude oil, mostly from the Caribbean. Canadian crude oil can be priced to compete with American crude oil in the large consuming centers of the Midwest, which now can be served from the south, via the CAP line, with domestic crude oil and oil imported from the Caribbean. Canadian crude oil is estimated to have a price advantage of approximately 60 cents per barrel against comparable United States crude oil.

Arctic Slope production in Alaska is the most important inside phenomenon which our oil industry has experienced in a long time. However, we must be aware that geographically the north slope area is somehow on the outside. Within the next year or so, we should know whether the discovery of the Prudhoe field is an isolated, but important event on our domestic scene, or whether it is the forerunner of further discoveries in a major sedimentary area that stretches over the Arctic.

The reserves at Prudhoe Bay have been estimated to be between 5 to 10 billion barrels, which would increase present American oil reserves by 10 to 20 percent and alleviate the political security factor somewhat. Potential production capability has been estimated at 1 million barrels per day, which should satisfy the expected increased demand for oil of some 300,000 barrels per day over a three-year period. However, our petroleum requirements by 1980 will amount to approximately 18 million barrels per day, and Prudhoe Bay reserves will not affect long-term planning to any great degree.

Generally well-informed sources indicate that Prudhoe Bay production potential will come from wells with a productive capability ranging between 3,000 and 5,000 barrels per day, and that production costs will be approximately 50 cents per barrel without royalties and income tax. The holders of the present oil and gas leases do not have to amortize large payments to the government such as have been offered and paid for leases in offshore areas of Texas, Louisiana, and California.

Prudhoe Bay oil is not low-cost oil in the manner of the Middle East or Libya, but it could compete in several markets in the United States and in certain areas of Western Europe and the Pacific. If it is suitable for the requirements of our markets and if its transportation over land and sea does not encounter insurmountable technical or economic obstacles, Prudhoe Bay oil could reach the Chicago area in competition

with Canadian and Texas oil via a proposed 1,600-mile pipeline running south to Edmonton, Alberta, where it could connect with the Interprovincial Lines. A pipeline tariff of between \$1.00 and \$1.20 has been assumed for the entire distance.

Arctic Slope oil will have a specific impact on our West Coast (District 5) which in 1967 had a local crude-oil deficiency of 550,000 barrels per day, of which 350,000 barrels per day were imported from Canada, Indonesia, and the Middle East. A proposed pipeline from Prudhoe Bay south across very difficult terrain through Alaska to open water on the Pacific would be only 700 miles long, and transportation should cost less than transportation from the Arctic to Chicago.

Trial runs from Prudhoe Bay to the East Coast of the United States by specially equipped oil tankers are planned for next summer.

The competitive price of Prudhoe Bay or other Arctic Slope oil at United States markets and at outside markets will ultimately determine the well-head price which producers will be able to obtain. Early indications suggest that the well-head price will be around \$2.00 per barrel.

However, if the optimistic estimates of Mr. Hickel, former Governor of Alaska and now Secretary of the Interior, are correct, the reserves in the American part of the Arctic Slope will be in the 50 billion barrel bracket, and a change in petroleum geography of major proportion must be faced. A complete realignment of the crude oil supply pattern within the American continent will cause a chain reaction to spread over the world. Similar realignments took place at the beginning of the 20th Century when the Lucas gusher of Texas was brought in, and when d'Arcy discovered oil in Persia.

CONSEQUENCES FOR THE PRODUCING AND REFINING INDUSTRY IN THE MID-CONTINENT AREA

The confrontation between the oil-producing and oil-consuming nations creates an acute and bitter problem, which is deeply interwoven with international power politics and with the investment interests of the Western nations in the producing countries. We have experienced a similar problem between producing and consuming areas and interests in the United States, and the

economic ideas of the two groups seemingly are strongly opposed with regard to the supply of energy. But are they opposed in reality?

The producing states, including those in the Mid-Continent area, must obtain the best possible price in order to replace dwindling oil reserves. The consuming states in the East desire the removal or modification of restrictions on import of foreign oil, which can reach these consumers at much lower costs than domestic crude or residual oil. The New England states, which are nearly devoid of energy sources, particularly demand low prices for oil and natural gas in order to provide cheap energy for future industrial development.

However, because of increased costs of labor, steel, and money, the producer exerts pressure for higher prices. Higher oil prices may trigger even stronger pressure from the consuming states that could lead to the breaking point. The buyer's market on the outside will not disappear in the foreseeable future, although some augurs predict that the imbalance in the world market will have been corrected by the mid-1970's. I doubt that a substantial increase in our present price structure for crude oil and petroleum products is likely unless the incoming Administration should fail to stop or significantly slow inflation. With no substantial increase in sight for domestic prices and with Arctic oil ante portas, oil production costs must be decreased if the producing states are to remain in a competitive position.

Even the price of natural gas is under pressure from East Coast consumers in an indirect way. Natural gas must remain competitive against cheap imported fuel oil, and the East Coast may receive supplies of liquified gas from the Caribbean in the not-too-distant future.

The independent refiner must face the fact that his source of domestic crude-oil supply will dwindle as the independent wildcatters' activity decreases. A single landlocked refiner cannot move foreign crude oil in small quantities inland economically unless his refinery is located in the northern tier of states along the Canadian border. Nevertheless, the small- and medium-sized refineries could, in my opinion, play an important role in case of a world catastrophe such as an atomic war. These refineries might be less vulnerable than the large refineries

centered in clusters at producing or consuming areas. The stocks of the small refineries could be the first untouched reserves of motor fuel that would be available to the surviving parts of the nation. Ways and means must be devised to assure the survival of the independent refiner.

FUNDAMENTAL QUESTIONS

I do not consider myself competent to formulate concrete suggestions as to how to deal with the many complex problems of our petroleum industry which arise from interaction between the outside and the inside. However, in my role as an old practitioner, I would like to raise some fundamental questions.

(1) The mandatory import restrictions of 1959 placed a powerful political and economic tool in the hands of the federal government. The facts of present international power politics present one of the challenges to our incoming Administration, and require reevaluation of military and world political considerations that influenced our policy in 1959. One might well ask whether economic security considerations do not demand a completely different approach from the policies of 1959.

(2) If a new approach is required, do the general trends toward regional concepts and developments not suggest expansion of an economic security concept from a United States unit to a Western Hemisphere Petroleum Region, comprising North America, Central and South America, and the West Indies?

(3) If such a Petroleum Region is created in cooperation with all free nations in the Western Hemisphere, under what circumstances and conditions could the Region be expanded to parts of the Atlantic and Pacific regions outside of the Hemisphere?

(4) Would not a Common Petroleum Market between Canada and the United States function as the natural focus for such a petroleum region?

(5) What measures could be taken in cooperation with member nations of the Western Hemisphere Petroleum Region to build a solid infrastructure for the Region?

(6) What specific steps could the United States consider?

(a) Could we not look generally for deliveries of hydrocarbons, as required by our supply position, to countries in the Region at competitive prices?

(b) Could action be taken to increase the flow of American risk capital, destined for foreign exploration, toward prospects in the Western Hemisphere Petroleum Region, especially the expanded region suggested by question (3)?

(c) Would it be advisable and legally possible to reserve the application of United States tax incentives for oil and gas exploration, production, and other capital investments in the oil industry to operate primarily within the Hemisphere Region and the expanded areas?

(7) Would the proposed Western Hemisphere Petroleum Region and the elimination of our high-cost producing wells not lead to a decrease of the cost of energy expressed in constant dollars, not only in the United States and Canada, but also in the developing petroleum-consuming countries within the Region, and help to stabilize prices for the producing countries?

(8) What can the federal government, the Interstate Oil Compact Commission, its member states, the leaders of our industry, industrial associations, and financial institutions working with the oil industry contribute toward a revival of the wildcatter spirit in order to keep the independent producer alive and expand his participation in the oil business again?

(9) How can the average production cost of oilfields in the United States be reduced to a more competitive level in spite of the general cost increases?

(a) Could an adjustment of conservation policy be an acceptable measure to reach this goal?

(b) Could a planned fade-out of small, uneconomical wells, extended over a period of approximately 10 years, be considered by the members of the Interstate Oil

Compact Commission, probably in cooperation with the federal government?

(c) Would such a fade-out not become unavoidable if and when additional discoveries in the Arctic Slope alter the pivotal position of Texas and Louisiana in our crude-oil production?

(10) Would it not be possible to reserve a small part of the price gap between the outside and the inside for the establishment of a Trust Equalization Fund to:

(a) finance the fade-out of uneconomical small wells,

(b) sustain the economic viability of the small landlocked independent refiner. Could these small refiners not establish a common purchasing and transport association for foreign crude oil to obtain lower costs on a delivered refinery basis, if geographically possible?

J. Cordell Moore, Assistant Secretary of the Department of the Interior, suggested in a recent address before the Oklahoma Independent Petroleum Association that a non-partisan presidentially-appointed committee or board be set up to review and recommend policies for administering the United States import program. Implementation by the incoming Administration of existing import regulations is a part of the many complex problems which the United States oil industry and the landlocked industry of the Mid-Continent face now and in the future. I suggest, therefore, that a non-partisan Board or Commission, as suggested by J. Cordell Moore, be appointed by the new Administration to deal with all of these complex problems which I have tried to review. Such a body should hear experts from all quarters, including foreign countries. If there is real oil bounty in the Arctic regions of North America, we may be at the beginning of a new era in our 110-year old oil industry. It could be a new ball game.

