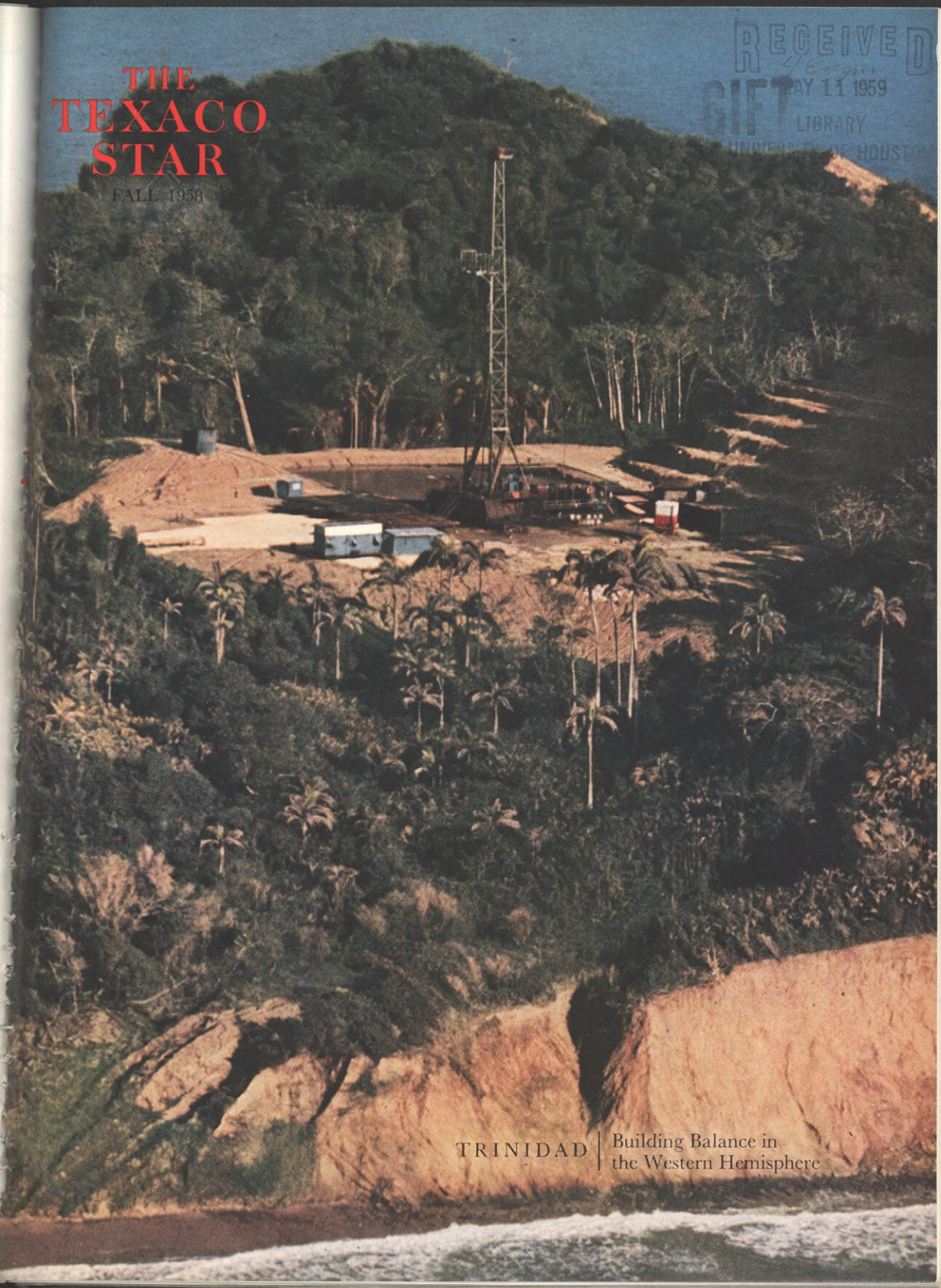
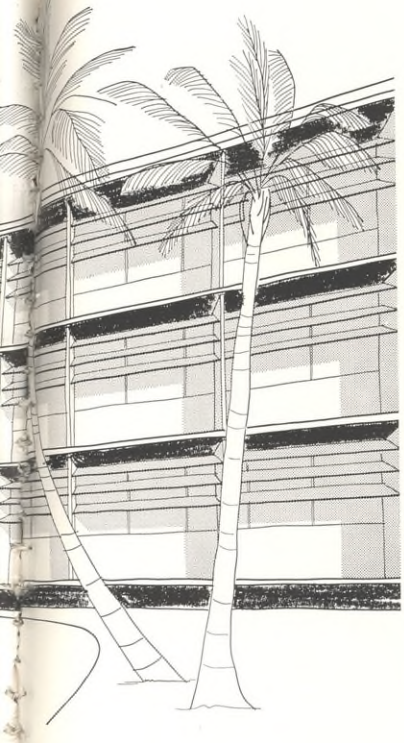
THE TEXACO STAR

FALL 1958



TRINIDAD | Building Balance in the Western Hemisphere

New under the sun
in Trinidad, and a striking symbol of the
economic growth which the oil
industry has brought to the Island,
will be the air-conditioned headquarters
building of Texaco Trinidad, Inc.,
scheduled for completion next year. Shown
here in an artist's rendering,
the boldly designed new building will
provide the finest possible facilities with
which to direct and coordinate the
steadily expanding Trinidad operation.



THE TEXACO STAR

CONTENTS OF VOLUME XLV • NUMBER 3 • FALL 1958

THE TEXACO STAR
A publication of
THE TEXAS COMPANY
135 East 42nd Street, New York 17, N. Y.

THE COVER: On Galeota Point, at the southeastern tip of Trinidad, the heavy bush has been cleared and leveled to permit drilling. To picture the almost impenetrable forest drilling crews encounter here—and in other producing areas on the Island—photographer Homer Page found it necessary to take his cameras aloft, with this revealing bird's-eye view the result.

THE STAR is published by the Industrial and Public Relations Department for Stockholders and Employes: **Thomas D. Durrance,** Director of Public Relations • **Ellis Prudden,** Supervisor, Publications Division; **Gordon Bowman,** Editor; **R. R. Fuller,** Staff Writer • Design: Irwin Glusker, consultant; Richard Hendler

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FOREIGN OIL

Why the industry must take the risks, make the investments, and endure the hardships which are all part of its overseas search for additional petroleum reserves

BY AUGUSTUS C. LONG

CHAIRMAN OF THE BOARD OF DIRECTORS

THE TEXAS COMPANY

The recent happenings in Iraq and the generally unsettled situation throughout the Middle East have once again pushed the issue of the free world's oil supply into the headlines. This is a development that holds serious implications for us all. Because it does, and because so many people are misinformed regarding foreign oil, this seems an appropriate time to assess its importance.

Today, almost 200 American companies — large and small — are engaged in exploration or production in more than 30 foreign countries, and their numbers are increasing. One of these is The Texas Company, which, through its subsidiary and affiliated companies, is searching for and producing oil in such diverse areas as France, Australia, Sumatra, Arabia, Canada, and Venezuela — to name just a few. All in all, the Company has an interest in one or more phases of petroleum activity in approximately 100 countries.

The capital required for foreign oil operations is enormous. In 1957, American petroleum investments abroad led all other categories, standing at *$9 billion,* or one third of total U. S. investments in foreign countries. This figure can be fully appreciated only when translated in terms of the tremendous amount of manpower and materials involved, as well as the difficult and hazardous circumstances under which foreign operations are conducted.

One of the most fundamental — and least understood — of these circumstances is the highly speculative nature of oil company investments overseas. Exploring for oil is an inherently risky business, and there is no part of the world where it offers any guarantee of success. The huge capital outlay required in foreign operations, however, throws this element of risk into high relief.

One company, for example, has searched for 40 years in Europe without finding enough oil to satisfy its needs in that market. This same company has drilled in Colombia for 22 years without recovering its investment, and it hunted in Iraq for a quarter of a century before payout began. Another company spent $48 million and 10 years in Venezuela before it could begin to market the oil it found. Still another spent $29 million drilling 187 wells in Indonesia — of which 169 were dry holes. Texaco spent almost 10 years searching for oil in Canada before bringing in its first producing well, and it waited 11 years before it received any income from its large investment in the Caltex Group. Other firms have spent scores of years and millions of dollars without finding oil in commercial quantities.

Dollars provide a cold and impersonal yardstick of a company's activities, but there is nothing cold or impersonal about foreign operations to those who conduct them. Wildcatting overseas is one of the world's greatest gambles. The man or woman who takes part in this global search for oil can count on more than his share both of hard work and of unusual experiences.

Texaco's role in the development of the Barco Concession in Colombia is a case in point. After 15 years of exploration, oil was finally found in commercial quantities. We then faced the problem of transporting crude from the producing field to a terminal on the Caribbean, 262 miles away. This meant constructing a pipe line through almost impenetrable jungles and across an Andean mountain range nearly 5,200 feet high. Since there were no roads, it was necessary for a fleet of planes to deliver some 11 million pounds of food and equipment, including several 350-foot-long suspension bridges which were prefabricated and loaded in sections. Before the job was done, these planes had covered a total distance of 621,000 miles.

Flying was one thing; working on the ground was another. For nearly two years an army of American engineers and Colombian laborers literally hacked their way through the dense tropical forests. Although the pipe line was completed on schedule, the Company's problems continue. Hostile Indians continue to attack our field crews and even nearby camps. And in the Velásquez field, also in Colombia, wildcatting had to be suspended earlier this year because of assaults by bandits.

Conditions such as these are not unusual to Texaco's foreign subsidiaries and affiliates. In an age of earth satellites and voyages under the North Pole ice, our crews in New Guinea drill in regions populated by headhunters, and in Sumatra they face the daily threat of marauding tigers. The weather these men work in ranges from the bitter cold of

the Canadian prairies to the tropical heat of the Trinidad swamps. Clearly, searching for oil overseas is not designed for the faint-hearted.

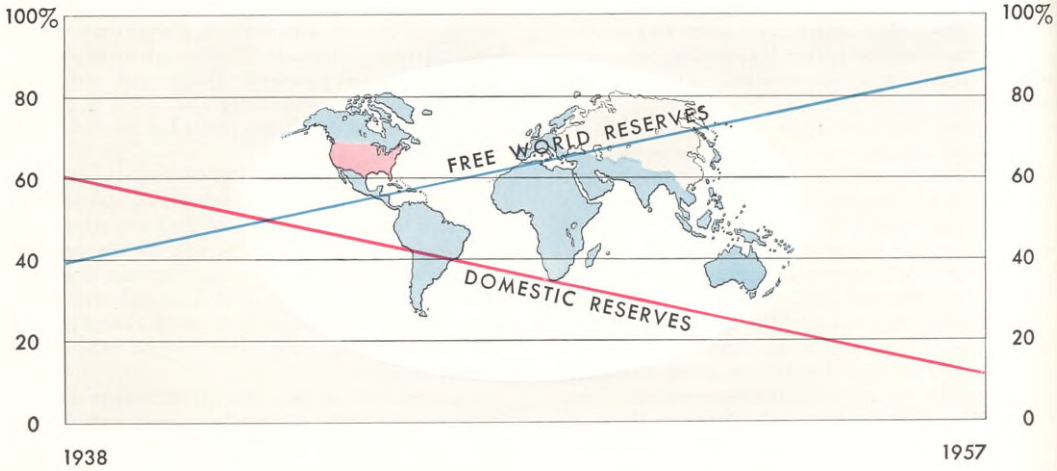
But foreign operations involve far more than exploring and drilling. When the first geologists and geophysicists for Arabian American Oil Company moved into Arabia they found that they had chosen a country in which everything had to be built from scratch, and with supplies that had to be hauled, in most cases, from halfway around the world. Entire towns had to be constructed, complete with homes, stores, hospitals, and recreation centers. Roads had to be built. Food had to be imported. Conditions were so primitive that drilling for water almost took precedence over drilling for oil. And all this effort and expense had to be undertaken before it was certain that there was any oil to drill for.

These expenditures, enormous though they were, were only the beginning. When oil finally was discovered, Aramco was faced with the task of manufacturing it into products and making it available to markets. To accomplish the former required building a refinery which to date has called for an outlay of several hundreds of millions of dollars. To accomplish the latter required the construction of harbor and docking facilities, and the laying of pipe lines (including Tapline, which alone cost $210 million).

While this was going on, Aramco was proving itself to be a good citizen of its adopted country. It built schools for the children, established industrial and language training programs for the workers, and awarded college and university scholarships for which any Saudi Arab might apply. It instituted programs of nursing training, medical research, and health care. It assisted local business to expand or get going, introduced modern farming tools and techniques, and provided water, sewage systems, and other facilities to nearby communities.

One such project in which Aramco takes particular pride is its financing of housing loans for Saudi Arab employes. As of 1957, Aramco had approved 1,821 loans to its Saudi employes, and had built or purchased 612 loan-plan houses. In addition, Aramco authorized the lending of money to Saudi enterprises for constructing loan-plan houses, arranged to lend funds to eligible Saudi employes for improving their homes, and increased the amount of money available for housing or for land purchase. A similar Company plan for the housing of native workers is in effect in Colombia.

The Company's efforts on behalf of both its American personnel and native workers are carried on in every country in which it operates. They constitute a kind of private Point Four, launched without the aid of the Government and supported without help from the American taxpayer. Indeed, were it not for this aid being given by The Texas Company and other international oil companies in many areas of the world, it is quite possible that the Federal Government



Over the last two decades, the percentage of domestic reserves to total free world reserves has dropped very sharply.

would find it necessary to support similar programs at the expense of the U. S. Treasury.

Even when this tremendous investment has been made, oil is being produced, and the entire operation is under way, the American company may find itself facing thorny problems. Most of these arise from the fact that many of the world's largest oil deposits are located in countries whose methods of conducting business are different from our own. As an illustration, a producing company in the United States will deal with individual landowners, but when it extends its operations abroad it must negotiate with governments.

An American business operating in a foreign land is a guest, and must abide by that country's laws and customs. At the same time, it frequently finds itself subjected to lengthy and expensive investigations — even harassment — by agencies of its own Government.

In the light of all these considerations, why does The Texas Company — and other international oil companies — continue the search for foreign oil? This question is puzzling to many laymen, who point out that, after all, this country is one of the world's great oil-producing nations. Why do we not simply take the oil we need from beneath our own soil?

The answer is that the oil reserves of the United States are simply not sufficient to continue indefinitely to satisfy our ever-increasing requirements. Whereas 20 years ago we had approximately 61 per cent of the free world's reserves, today we have about 13 per cent. And last year we used seven times as much oil as we discovered in new fields.

This is not to say that the United States is "running out of oil." The fact is, nevertheless, that oil is becoming increasingly difficult to find in this country. In the year 1957, for example, there were nearly twice as many wells completed as in 1938, yet the number of dry holes rose by more than three times. In short, over this 20-year period the domestic industry's ratio of failures to successes rose by more than 100 per cent.

Another measure of our domestic reserves picture is the amount of oil which our newly discovered fields are capable of producing. The most promising areas for oil production have long since been drilled up, with the result that the fields we are finding today are relatively small compared with those brought in years ago. Of the 27 fields that produced 10 million or more barrels of crude each in 1957, the two most recent were discovered in 1950, and only eight were less than 20 years old. All the others — some of them dating back more than 50 years — were drilled at a time when the chances of making a major discovery were far better than they are today.

Modern exploration is a highly scientific undertaking that must be supported by constant and costly research. At the same time, wells have to be drilled deeper, and since the cost of drilling tends to increase in geometric proportion with the depth of the well, the financial burden of adding to our reserves is growing at an alarming rate. Unfortunately, there is nothing now on the horizon that promises relief from this situation.

With the ratio of dry holes to producing wells on the rise, and with the new discoveries showing less and less potential capacity, the domestic industry is finding it increasingly difficult to meet its commitments. Today our consumption of petroleum products represents 54 per cent of total free world demand. By 1965, consumption is expected to go up by another 30 per cent. Clearly, if this country is to safeguard its economic well-being and national security, our oil companies must press forward their search for new reserves outside our borders.

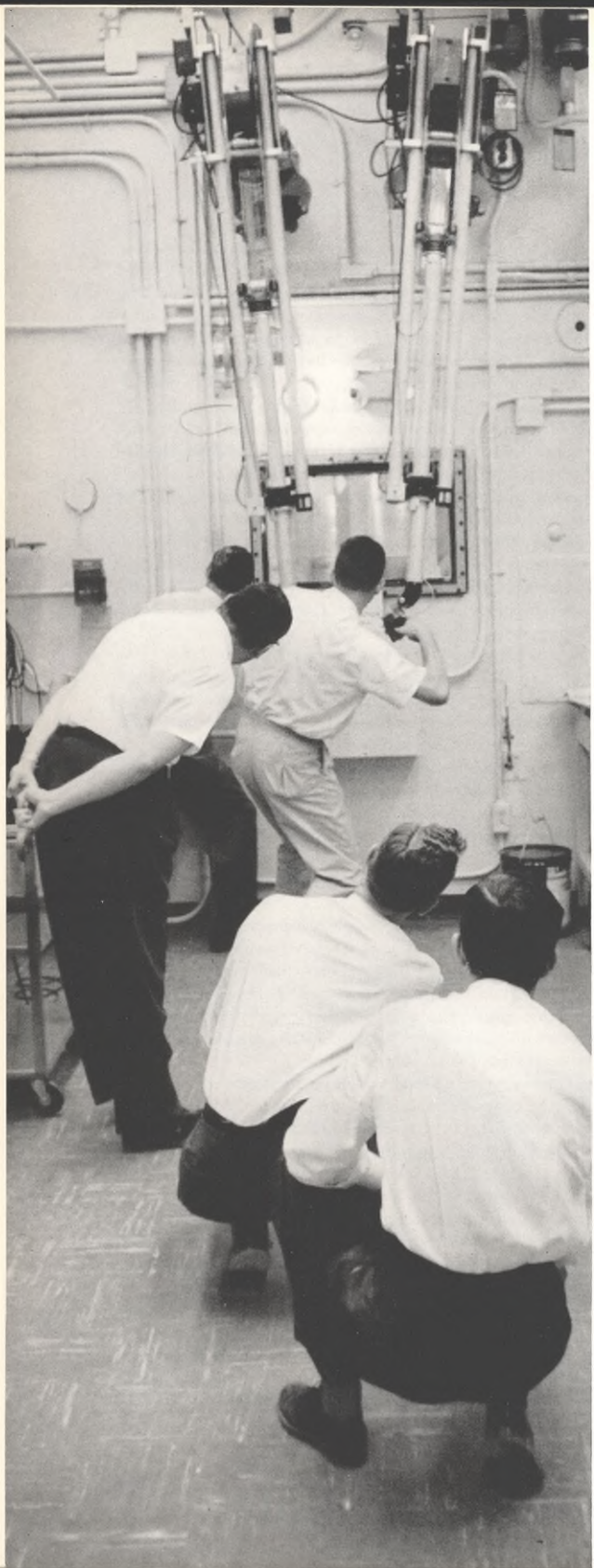
The Texas Company has played a leading role in international oil. We have made our investments on a long-range basis, and with full knowledge of the costs and risks that are involved. In our relations with foreign governments we have found that our best protection lies in living up fully to our obligations, concentrating on the oil business, and staying out of politics. At the same time, we have done everything possible to make a maximum contribution to the welfare and progress of the countries in which we have worked. We have prospered under this policy, and we intend to continue living by it.

While we are proud of our achievements overseas, it is well to remember that they have not come easily. Some people—influenced by the headlines which accompany success in certain foreign oil operations—believe these operations are less expensive than domestic operations, and that foreign oil is "cheap" or "easy" oil. They overlook the more numerous but less publicized failures.

Due to the risks and uncertainties, foreign operations must be considered as a whole, and the value of those rare situations where large reserves of oil are found must be offset by tremendous losses which have occurred and are occurring in the search in other foreign areas.

The security of the United States and, indeed, of the entire free world depends upon continuation of the effort to find and develop new reserves beyond our borders, and the retention of those concessions presently held by American oil companies operating abroad.

This security, and the continued overseas operation of American companies—with the inherent hazards foreign operations present—is possible only if our own Government recognizes the importance of establishing a climate which encourages rather than harasses such effort. ●



New Versatility

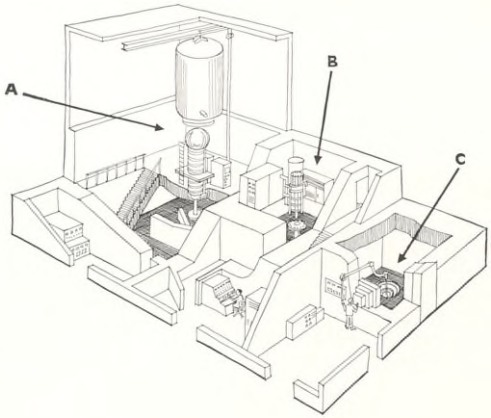
Use of cobalt-60 at Beacon given

Largest single amount of radioactive cobalt-60 in use in oil industry research, and second largest outside the facilities of the Atomic Energy Commission, was delivered this past Summer to the new Radiation Laboratory at the Texaco Research Center in Beacon, New York. It was the third, and most potent, radiation source to be installed in the laboratory—giving the Company the most versatile range of radiation research tools in private industry. (Already in the laboratory were an electron linear accelerator and a Van de Graaff generator.)

Ordinary cobalt, the atoms of which contain 32 neutrons and 27 protons, is made radioactive by nuclear bombardment during which some of the atoms capture one additional neutron—hence the designation cobalt-60.

Texaco's supply of radioactive cobalt was under bombardment for almost three years in the nuclear reactor (or atomic pile) operated at Chalk River, Ontario, by Atomic Energy of Canada Limited. In the reactor, fission of uranium releases neutrons which bombard the natural cobalt. The degree of radioactivity induced depends upon the number of atoms which capture an extra neutron during the bombardment. After nearly three years in the atomic reactor, Texaco's supply of cobalt-60—which weighs somewhat less than 22 pounds, and in powdered form would fill a quart milk bottle —is rated at 29,100 *curies*. It is equivalent in radioactivity to about 64 pounds of radium.

Everyone is familiar with certain kinds of radiation—the light from the sun, the heat that pours from the open door of a furnace. The radiations given off by cobalt-60, and those produced by the linear accelerator and the Van de Graaff generator, are, of course, radically different.



Sketch shows location in new laboratory of (A) Van de Graaff generator, (B) electron linear accelerator, and (C) "hot cell" for cobalt-60. Photograph on left-hand page was taken when group in control room watched unloading of first "pencil" of cobalt-60 in cell through leaded window three-and-half-feet thick. The technician nearest window is operating slave manipulators which activate mechanical hands inside cell. The laboratory's cobalt-60 supply is equivalent in radioactivity to about 64 pounds of radium.

ity for Texaco Researchers

gives company scientists an important edge in their search for better products and processes

When these radiations strike a chemical they give up enough energy to break up the molecular structure of that chemical. The rearrangement of molecules is an old story, for the alteration of the molecular structure of hydrocarbons produces gasoline and other petroleum products. Conventional refining processes, however, do this by heat and catalysts. Radiation does something more than heat and catalysts; certain types of reactions are brought about that are not possible by any other means known today.

A good example is the effect of the exposure of polyethylene (one of many plastics derived from petroleum) to the radiations from cobalt-60. This also gives a clue as to how the new tool can be used in the Company's research program.

Polyethylene is an excellent electrical insulator, but it melts easily. Exposed to sufficient cobalt-60 radiation, however, it no longer melts, and polyethylene tape so treated can be used to insulate wires in electric motors which run at high temperatures. This is just one example of many possible product improvements that may be brought about by the controlled use of radiation.

Much of the initial work at the laboratory will be basic research. Scientists do not yet know all the atomic and molecular changes that may be caused by irradiation, but enough is known to convince them of its possibilities in improving petroleum products and processes, and creating new products—a new family of petrochemicals, perhaps.

Texaco's radioactive cobalt is in the form of one-inch slugs —1,404 of them. At the time that the Company decided to use cobalt-60 as a research tool, the U. S. Atomic Energy Commission's supply was committed for a year to medical research. Fortunately, it was found that the Canadian organization had a supply of ordinary cobalt under bombardment in its Chalk River atomic pile.

Before being subjected to nuclear bombardment, the cobalt slugs were encased in aluminum containers to eliminate any danger from flaking of the cobalt. After being made radioactive, nine of the slugs were sealed in "pencils," each half an inch in diameter and 11 inches long. Thirty-nine of these pencils were placed in each of four 6,500-pound lead containers for the trip by truck from Canada.

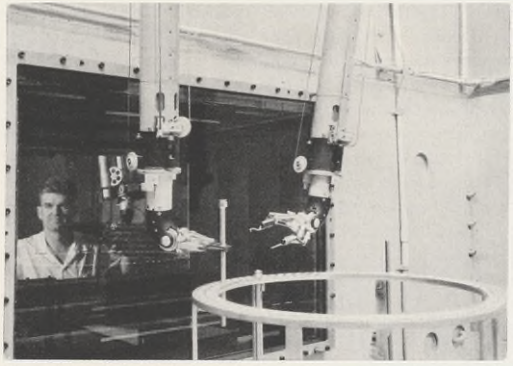
It took several days to remove the pencils from the lead carriers after the truck arrived at Beacon. One cask at a time was placed in the "hot cell" in which the cobalt is kept at all times. (All three radioactive sources are handled remotely.) To protect the operators from the highly penetrating rays given off by radioactive cobalt, the cell is made of thick concrete walls — the door alone weighs 13 tons. Technicians removed the pencils by using "slave manipulators" operated behind a three-and-a-half-foot leaded glass window. As each pencil was removed it was first washed in detergent, rinsed, and then measured for its exact radioactive potency — and finally was lowered into a circular rack, two feet in diameter.

This rack sits on a remote-control elevator and when not in use is lowered into a water-filled tank 17 feet deep. The radiation from cobalt-60 cannot be turned on and off like an electric light, but when it is lowered to the bottom of the tank no radiation can escape into the cell. (The door to the cell, incidentally, can be opened only when the cobalt is in a submerged position.)

Normally the cobalt-60 pencils are placed in two rows in the circular rack. With the pencils in this position, the maximum radiation is in the center of the rack and it is here that

Texaco's radioactive cobalt, weighing less than 22 pounds, was trucked from Canada to Beacon in four 6,500-pound casks.

After a test for radioactivity leakage (negative), the first cask containing cobalt-60 pencils was moved by crane into the laboratory.



Many "dry run" unloadings of the pencils in hot cell were made before arrival of cobalt-60, to perfect remote-control techniques.

chemical samples requiring the greatest radiation for study are placed. Smaller doses of radiation can be given samples by reducing the number of pencils being used, or by moving the samples various distances away from the radiation source.

The three sources of radiation at the Radiation Laboratory differ in capabilities and purposes. Each has a specific job to do, tailored to its particular characteristics.

The cobalt-60 supplies the most penetrating radiation of the three. It can be used to irradiate open samples to a higher degree than either the linear accelerator or the Van de Graaff generator. It can also be used to reach samples which must be kept in steel-walled reactors surrounded by heating jackets. The temperature, pressure, and flow found in actual refining processes can be simulated in these containers, and the highly penetrating rays will reach the samples inside.

The six-to-10 million volt electron linear accelerator is an "electron gun." The electrons shot from the gun penetrate less deeply into matter than do the rays of cobalt-60, so this source is used only when the materials being irradiated can be exposed directly or housed in very thin-walled vessels.

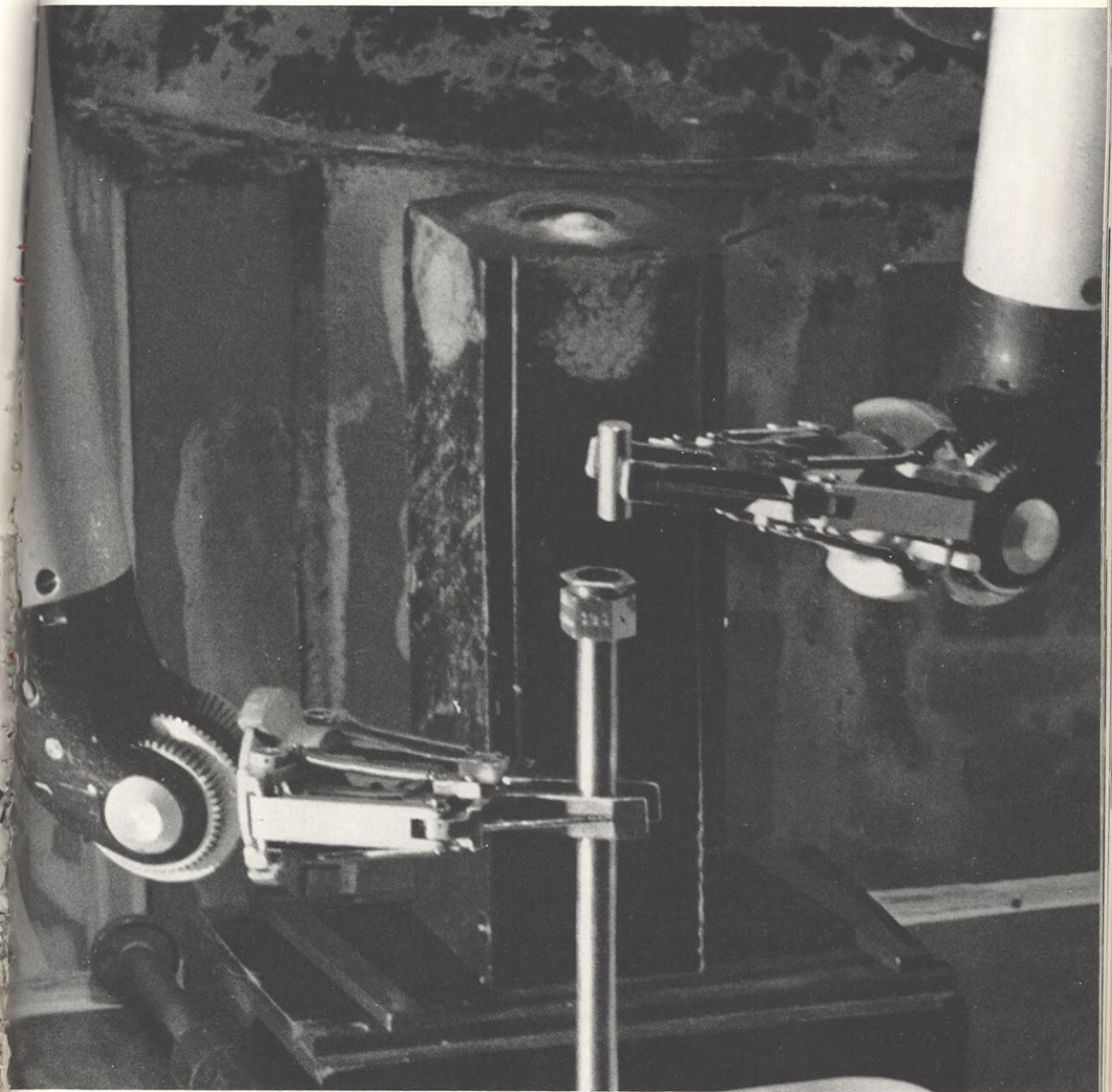
The electrons from the accelerator, however, do create X-rays when they strike certain metals. For this reason the accelerator's target room is surrounded by protective concrete walls seven feet thick.

The three-million volt Van de Graaff positive ion generator is used for analytical work. The apparatus generates and bombards a target with a stream of high-energy, positively charged particles. When the stream is directed onto certain metals neutrons are produced, which in turn are used to make minute quantities of materials radioactive for tracer studies. The Van de Graaff generator, interestingly, is the only one of the three radiation sources capable of making other materials radioactive. The rays from cobalt-60 and the electrons produced by the linear accelerator do not create radioactivity; they simply bring about chemical changes.

In addition to the radiation sources, the new building at Beacon also includes a "hot lab" where radioactive materials up to one *curie* in activity can be handled, two organic chemical laboratories, a tracer lab, and an analytical lab. The building was designed to give a wide margin of safety to personnel. The walls surrounding the radiation sources vary in thickness from three-and-a-half to seven feet. Special high-density concrete is used where necessary. Doors are equipped with electronic safety devices. Even the expelled air is passed through special filters that remove particles far finer than those of cigaret smoke. A full-time radiation safety officer is on the job to see that optimum safety conditions are met.

The Radiation Laboratory, equipped with the most advanced facilities available, gives Texaco scientists a versatility unmatched in petroleum research. ●

will be learning more about the effect of radiation on hydrocarbons and other chemicals



Close-up shows one of the inch-long slugs of cobalt-60 being inserted in aluminum pencil at AECL's laboratory in Ottawa.

Directors Visit New England and Eastern Canada

How does Texaco's top management keep in intimate touch with the Company's world-wide operations? Augustus C. Long, Chairman of the Board of Directors, in answer to such a query at this year's Annual Meeting of the Stockholders, pointed out that one important way in which the Company's executives keep in touch is by frequent and extensive travel.

This policy extends to the Board of Directors. In the past few years Directors have made inspection trips to many Company plants and offices, as well as producing areas, in the United States and Canada. They also inspected properties in Venezuela and Colombia in 1956.

Over a week end in Midsummer the Board visited Boston, Montreal, and Toronto. It was a long week end, and a busy one for the Directors.

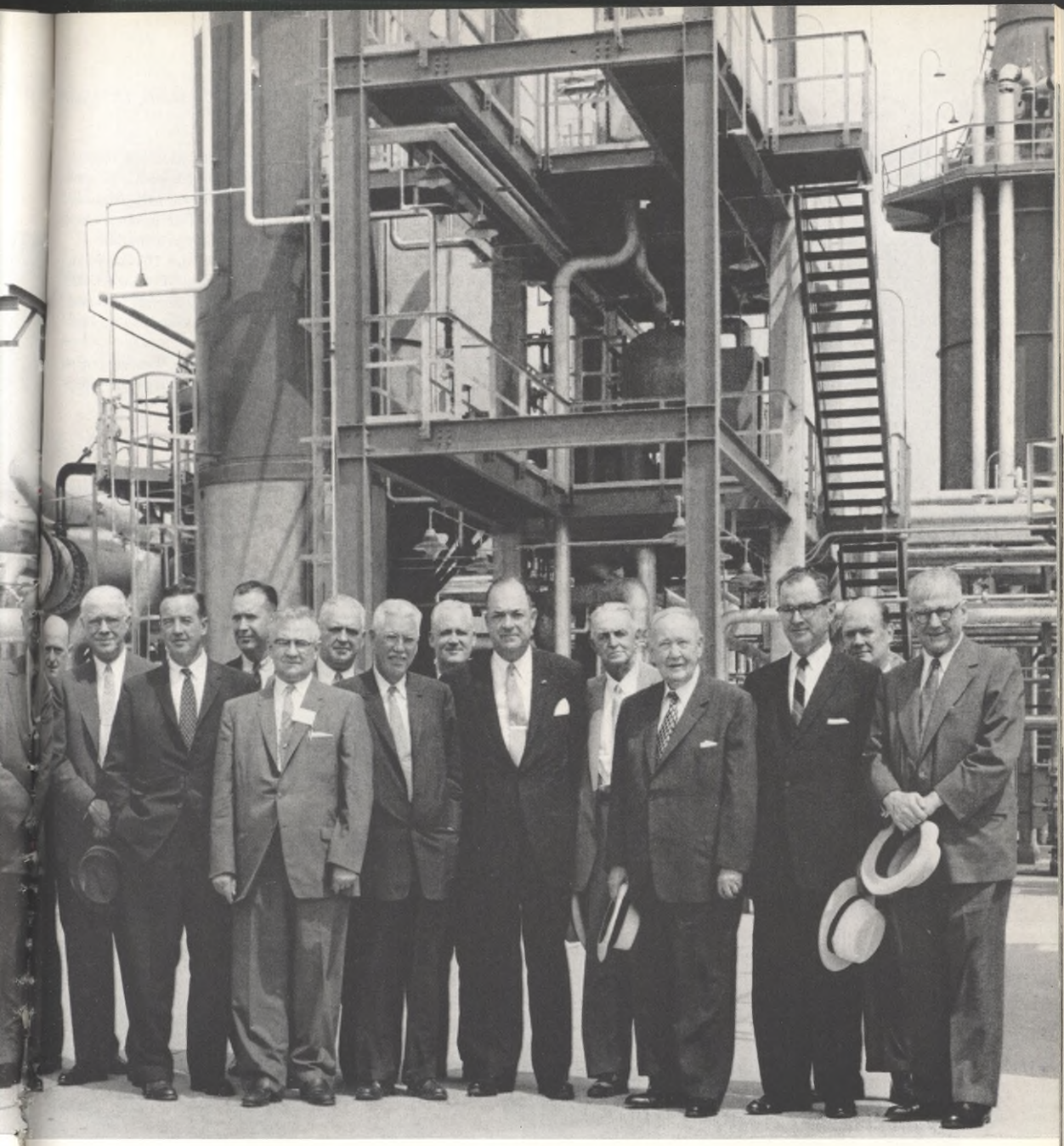
At Boston, aside from holding a regular monthly Board meeting, the Company's Directors inspected the Domestic Sales Department's Boston Division Office, headquarters for the six New England States. There they were briefed on plans for improving both wholesale and retail sales outlets for Texaco products. One project with this aim is the conversion of the barge terminal at Chelsea, in the Greater Boston area, into a terminal large enough to accommodate tankers. It will have a storage capacity of 13,650,000 gallons —more than nine times the capacity of the barge terminal. The conversion is already under way and is expected to be completed by next Summer.

Texaco service stations are located in almost every city and town, and on every important highway, in New England. The entire six-state region is one of the nation's most popular vacationlands. Although the Company is now one of the leading marketers in New England, the Sales Department is mapping plans to improve this position. New England is also a great industrial market: its per capita income is 13.5 per cent higher than the national average.

Continuation of the trip from Boston to Canada made it possible for the Board to inspect major eastern facilities of the McColl-Frontenac Oil Company Limited, a Canadian subsidiary. Western Canadian properties of McColl-Frontenac were visited by the Board in 1954. That trip was devoted chiefly to an inspection of producing activities.

Directors arrived in Montreal, where McColl-Frontenac's executive offices are located, on Friday afternoon. On Saturday morning they were briefed on that company's facilities, plans, and prospects. They then visited Montreal Works—

Pictured at the Montreal East refinery of McColl-Frontenac Oil Company Limited, a Texaco subsidiary, are, from left to right: J. S. Leach, Director and former Chairman; O. J. Dorwin, Director and Senior Vice President and General Counsel; Kerryn King, Vice President (Industrial and Public Relations); C. B. Barrett, Director and Senior Vice President, Houston; R. C. Shields,



Director; E. W. Quinn, Assistant Secretary; T. C. Twyman, Senior Vice President; A. N. Lilley, President of McColl-Frontenac; M. J. Epley, Jr., Vice President and Assistant to the Chairman; H. M. Bolitho, Superintendent, Montreal Works; A. G. Farquharson, Vice President (Refining), McColl-Frontenac; C. L. McCune, Director; W. E. Avery, Secretary; Augustus C. Long, Chairman of the Board of Directors; G. N. Aldredge, Director; W. J. Cummings, Director; J. W. Foley, Director and President; C. C. Dunn, Vice President (Marketing), McColl-Frontenac; and W. S. S. Rodgers, Director and former Chairman of the Board. Other Texaco Directors participating in the trip but not shown here included W. S. Gray, H. U. Harris, and W. H. Mitchell.

In the past few years, Company Directors have traveled extensively includ

Mc-Coll-Frontenac's largest refinery—which has a rated capacity of 59,000 barrels of crude oil daily.

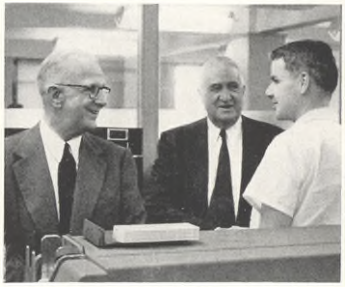
On Sunday morning they started a tour of facilities in and around Toronto, stopping first at McColl-Frontenac's Terminal and Oil Blending and Grease Manufacturing Plant, located on Lake Ontario. Next stop was the Port Credit, Ontario, refinery of Regent Refining (Canada) Limited, which is a McColl-Frontenac subsidiary. Port Credit Works has a capacity of 20,000 barrels a day, and is located about 10 miles west of Toronto.

Through its acquisition of Regent Refining in December, 1956, McColl-Frontenac not only increased its refining capacity, but also added substantially to its retail outlets. The integration of Regent's operations with McColl-Frontenac's is being completed. Thus Texaco, through McColl, is in a better position today than ever before to contribute to and profit from the industrial expansion in Canada.

McColl-Frontenac markets in nine of the 10 Canadian provinces, using the Texaco trade-mark. Texaco credit cards are honored at McColl-Frontenac service stations and McColl credit cards are honored at Texaco service stations in the United States.

In addition to getting a firsthand view of Texaco properties and personnel, the Directors take time out during their

Above: Directors inspect credit card accounting section in the Boston Division Office. In foreground, from left to right: J. J. Lynch, Chief Accountant, and Messrs. Foley, Long, Aldredge, and McCune. Below: A. N. Lilley, President, McColl-Frontenac, discusses this subsidiary's future planning with visiting Texaco Directors at company's headquarters in Montreal.



Two former Chairmen: Directors Rodgers and Leach during visit to Boston Division Office, group's first stop on inspection tour.

Quick coffee break at Montreal Works, McColl-Frontenac's 59,000 BPD refinery.

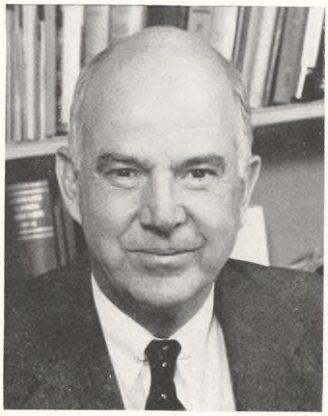
sively, luding trips to Canada and South America

inspection trips to meet business and civic leaders wherever they stop. In this way they get an intimate "feel" of local business conditions, and in a real sense they also serve as good will ambassadors for the Company.

In the recent past the Board has usually taken only one inspection trip a year. This year, however, there will be two. This Fall, Directors are visiting Los Angeles and Anacortes, Washington. At Los Angeles, they will inspect the new West Coast headquarters building which was completed in the Spring, along with other facilities in the area. At Anacortes, they will inspect the new Puget Sound Works, which has a crude capacity of 45,000 barrels a day. ●

"Tour With Texaco"—good advice in Canada, too! At Toronto Bulk Plant, Mr. Dorwin, District Sales Manager G. S. Mitchell, and Mr. Cummings make inspection of plant's facilities.

Regent's refinery at Port Credit was final stop on tour. Below, from left to right: Messrs. Dunn, Twyman, Foley, Long, Avery, and King.



LANGBOURNE M. WILLIAMS

Elected to Board

The election of Langbourne M. Williams as a Director of The Texas Company was announced July 25 by Augustus C. Long, Chairman of the Board of Directors. Mr. Williams is board chairman and chief executive officer of Freeport Sulphur Company, which for many years has mined sulphur on certain Texaco properties.

Texaco's new Director, who brings the membership of the Board to 15, also is a director of the B. F. Goodrich Company, a trustee and former chairman of the National Industrial Conference Board, and a member of the Business Advisory Council for the Department of Commerce.

Mr. Williams was born in Richmond, Virginia, and is a graduate of the University of Virginia, where he was elected to Phi Beta Kappa. He received an M.B.A. degree in 1926 from the Graduate School of Business Administration, Harvard University. After several years in private banking, he joined Freeport Sulphur in 1930 as vice president and treasurer. He was president from 1933 until this year, and has been chairman since 1957.

Freeport Sulphur's association with Texaco dates back to 1922. Since 1951 it has operated at two Texaco sulphur domes in Louisiana.

BUILDING BALANCE IN THE WESTERN HEMISPHERE

Steady expansion of Texaco's Trinidad operations is boosting the Island's economy — and adds importantly to the Company's crude reserves, production, and its refining capacity on this side of the Atlantic Ocean

In the thick, tangled forests of Trinidad and offshore in the Gulf of Paria, the men of Texaco Trinidad, Inc., are adding a new chapter to the exciting history of this Caribbean Island.

Throughout the Island's rugged southern country — in the bush around Guayaguayare, at Forest Reserve, and in the swampy lagoons that circle Barrackpore — their drilling rigs are at work. Bulldozers and tractors clear ribbons of road through some of the toughest terrain ever tackled by oilmen, and the sound of their work mingles strangely with the calls of rare birds and the racket of the *cigale* announcing oncoming rain.

In the Gulf (almost a lake, at times quite rough, separating Trinidad from the South American mainland) marine drilling platforms, alternately baked by the tropical sun and swept by torrential downpours, rise above the surface like prehistoric sea monsters. Far below, drilling bits are chewing into the bottom of the Gulf in a tireless search for more oil.

Day and night, tankers ease in and out of Pointe-à-Pierre, the Island's busiest port and site of Texaco Trinidad's gleaming, growing refinery.

This busy-ness is meaningful on many counts. Never before have oil exploration, producing, and refining operations in Trinidad been pushed to such high levels. Leading the accelerated activity, and the most important element in the Island's petroleum industry, is Texaco Trinidad.

Since the Trinidad organization's acquisition by Texaco in 1956, these have been the major developments:

Throughput at the refinery has been stepped up more than 60 per cent — from 75,000 to 125,000 barrels a day — and a continuing program of improvement and expansion is being carried forward. Already the second largest refinery in Texaco's operations, Pointe-à-Pierre is programmed with substantial additional capacity in the near future.

Crude production has been increased from 30,000 barrels a day to 50,000 barrels a day, and at the same time a vigorous exploration program has increased reserves by 60 per cent. Now accounting for 50 per cent of the Island's total crude production, Texaco Trinidad has had as many as 16 drilling rigs employed in the search for new oil.

For Texaco Trinidad and its 8,300 employes, being part of the Texaco organization has brought the capital vital to continued growth, and the assurance — in an increasingly competitive industry — of wider world markets for its refining operations.

Beyond these considerations, Texaco Trinidad's growth

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One of Trinidad's most promising
producing areas lies offshore,
far beneath the surface of the Gulf of Paria

A Sunny Island's Colorful Heritage

About the size of Rhode Island and shaped like a fat riding boot, Trinidad lies off the coast of South America east of Venezuela only 10 degrees north of the equator. The Island — 65 miles long and 48 miles wide — was discovered in 1498 by Christopher Columbus during his third voyage, and claimed by him for the Crown of Spain.

First sighted by Columbus were the peaks of three hills in the southeastern part of the Island, which led him to name it La Trinidad — the Trinity.

At the time of its discovery Trinidad was inhabited by Indian tribes. The Spaniards made several abortive attempts at colonization but were not successful until the close of the 16th Century. In 1777 a Frenchman named Saint Laurent visited Trinidad, was impressed by the fertility of the soil, and, with permission from the Spanish Government, brought in a colony of French sugar planters and a large slave labor force. Twenty years later, the British — at war with Spain — captured the Island and won it by the Treaty of Amiens.

Abolition of slavery throughout the British Empire in 1834 brought an influx of indentured East Indians to Trinidad which continued until 1917 when this system, too, was outlawed. As a result, more than one third of Trinidad's present population of about 750,000 are East Indians or of East Indian descent. African, Portuguese, and Chinese immigrants over the years have added to the polyglot nature of the Island's population — and have brought to it a rich mixture of cultural backgrounds. The northern part of Trinidad is dominated by a range of mountains. The geog-

Sugar (being harvested here), coffee, and cocoa are three of Island's most important crops.

Trinidad and Tobago Tourist Board

"The Red House" in Port-of-Spain was the scene of the inauguration of the first legislature of the newly formed West Indies Federation, in April of this year.

This brilliant foliage on a hillside overlooking Port-of-Spain is typical of the Island's lavishly colored growth.

Such diverse cultures as East Indian and African have helped shape the Trinidadian rhythms.

raphy of the south is characterized by swamps, rugged plateaus, and forests. Temperatures around the calendar: highs of 85-90 degrees during the day, 60's at night.

Besides oil, Trinidad has a considerable agricultural development consisting of sugar, coffee, and cocoa plantations. It also produces coconuts, bananas, oranges, and grapefruit.

One of Trinidad's foremost revenue-producers, and a tourist attraction, is Pitch Lake near Brighton, the world's largest asphalt reservoir. History records that Sir Walter Raleigh, searching for El Dorado, stopped at this huge gray-black morass to caulk his ships. More than a half-mile wide and 285 feet deep, the lake has given up natural asphalt used, before the development of petroleum asphalt, on thoroughfares in both hemispheres—including Chicago's Michigan Boulevard and London's Victoria Embankment.

For botanists and bird lovers, Trinidad is a veritable paradise. Its heavy foliaged forests abound with *immortelles,* brilliant red-orange flowering trees; and *pouis,* which break out in bright yellow flowers four days every year. Heavy stands of bamboo, teak, mahogany, and mora are splashed with blue, pink, green, and purple vines which grow in great profusion. Trinidad's equally colorful birdlife is dominated by hummingbirds (Cariban Indians, first settlers of the Island, originally named it "Iere"—land of the hummingbird), Amazon parrots, and herons, but includes a ubiquitous sparrow-sized specimen known as the *qu'est-ce-qu'il-dit* (What did he say?). This fellow repeats his questioning call from dawn to dusk — and never gets an answer. ●

Building Balance in the Western Hemisphere

Near Pointe-à-Pierre, above, a gathering line feeding the refinery is rerouted to bypass a new housing development. Below, workers at a drilling site unconsciously display a nimbleness characteristic of the Island's people.

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is of paramount interest to the Government of Trinidad.

Although Trinidad has a substantial agricultural development, the petroleum industry is the most important single factor in the Island's economy. Last year, the industry provided 44 per cent of Trinidad's total revenue and accounted for over 80 per cent of the total value of its exports. Petroleum is the largest industrial employer, and also is the principal subcontractor and purchaser of local and overseas materials of many kinds.

Trinidad is one of the most difficult countries in which to find and produce oil in commercial quantities. For six months out of the year, Trinidad's fields, swamps, and bush-covered terrain broil and steam under a rivet-hot sun; then, beginning in June and running through November, the Island is subjected to rains that turn the producing fields into great quagmires.

In addition, the driller encounters every possible difficulty including high gas pressure, exceptionally hard formations, and soft caving formations. To reach drilling sites, roads have to be carved through the bush; and once built, they must be carefully maintained to keep them from deteriorating and being taken over again by the fast-growing forest.

The terrain is so rugged that Trinidad has become the leading exponent of directional drilling — drilling a number of wells from one site, each at an angle, to avoid moving the rig great distances. It is not unusual to find seven, eight, or nine well completions from a single such site.

Of the 158 companies that have been formed on the Island, only eight remain today.

Among Trinidad's most significant historical sites is one seldom visited by tourists. It is a small clearing off a winding dirt road in the thickly wooded south central region.

In this place, in April, 1914, Trinidad's first well to produce oil in commercial quantities was drilled. Helena No. 1 — long since on the pump and still producing three barrels of crude a day — was the discovery well of Texaco Trinidad's Forest Reserve field. When she blew out at 493 feet, a new era in Trinidad oil history began.

From the humble beginnings symbolized by Helena, the company's producing operations have expanded throughout southern Trinidad and into the offshore areas. In 1956, 63 wells were drilled by Texaco; last year the figure was 121. It is expected that a total of 172 wells will be drilled in 1958.

Chief Texaco producing areas are Forest Reserve, Barrackpore, Guayaguayare, Brighton-Antilles, and Soldado Operations (*see map, Page 16*).

Forest Reserve is the largest single producing field on Trinidad. More than 1,150 wells have been drilled in this field, of which some 700 are currently producing a total of about 27,000 barrels a day.

An off-again-on-again proposition through the years, Barrackpore has been saved from abandonment on several occasions by the last-minute discovery of new production. Exploratory drilling is now extending the field, and current output of 4,000 barrels a day for the area is at record levels.

Guayaguayare is the most remote field, and perhaps one

Pushing back the thick, tropical forest and keeping it pushed back is one of the toughest aspects of producing operations

Roads such as the one above, originally built for producing operations, often become important travel routes for the Islanders. Almost constant expansion at the Pointe-à-Pierre refinery, below, has increased its capacity more than 60 per cent in the brief period of two years.

of the most difficult drilling areas on the face of the globe. Its rugged terrain is covered with dense, rain-forest growth; its geological structures are complexly folded and faulted. Despite these formidable obstacles, new reserves have been established; last year, 38 new producing wells were drilled.

Outstanding aspect of operations in the Brighton-Antilles field is the drilling of high-angle directional wells under the Gulf of Paria. By the beginning of this year, a total of 73 wells — some deviated as much as 70 degrees from vertical — had been completed to locations offshore.

Further development is being carried out from an offshore platform — the largest such platform in operation outside the territorial waters of the United States. The drilling platform allows for 36 wells, and for extension if the formations appear to justify it.

Also in the Gulf of Paria, Texaco Trinidad is the operator, with a one-third interest, in 220,000 acres held by Trinidad Northern Areas. In the Soldado sector of the TNA lease, production currently is from two marine platforms. Three wells were drilled from the first, located six miles offshore, and a total of 10 wells—seven of which have been completed —will be drilled from the other, about half a mile due east. Later this year it is planned that a third platform will be erected for exploration drilling.

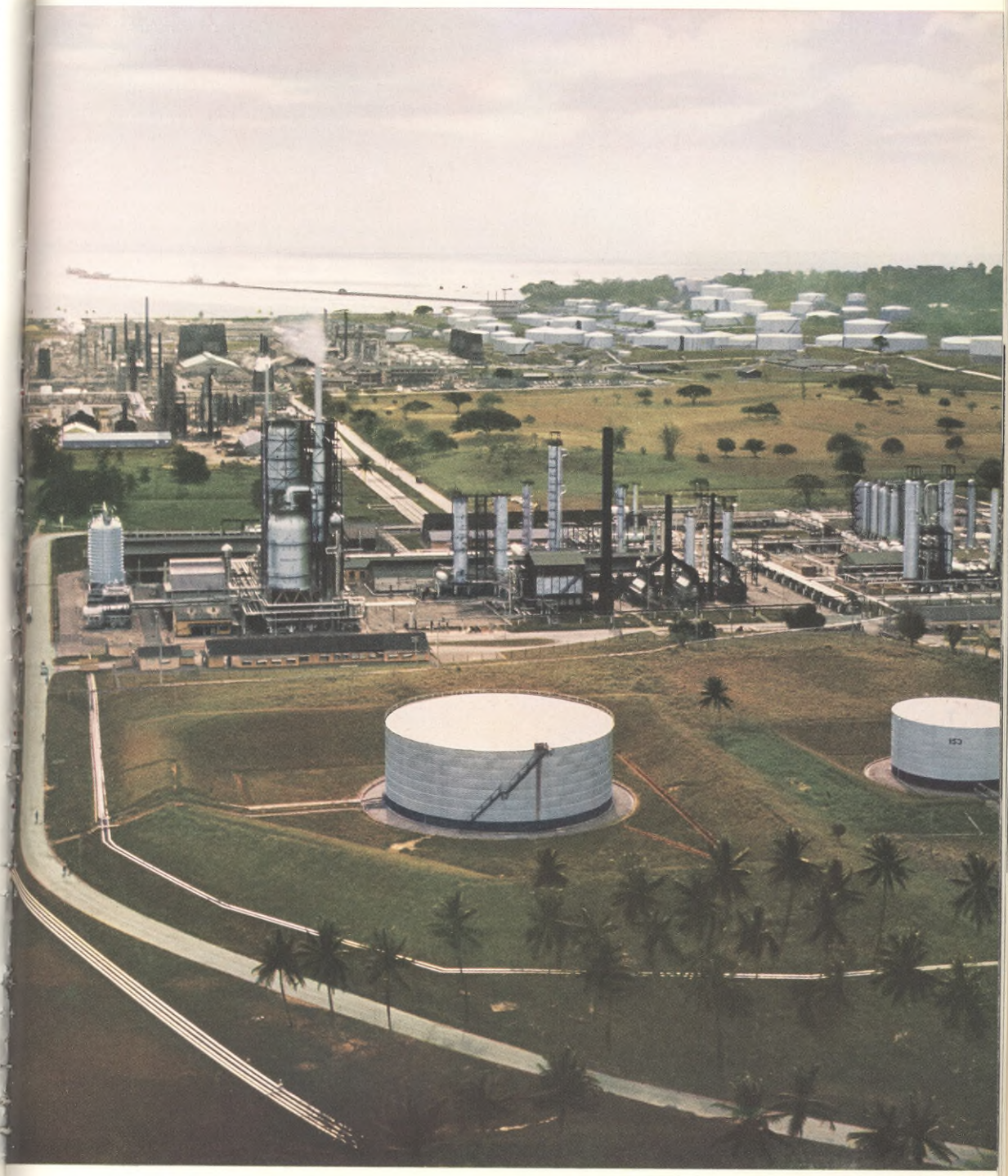
The crude oil from these scattered producing areas is transported by pipe line to Texaco Trinidad's Pointe-à-Pierre refinery. A beautifully laid out site, it is also an outstandingly modern installation.

Refining operations here, which contribute substantially to the Island's revenue from oil activity, go back to 1917 — when a small plant was built to supply fuel for the British Navy. Twenty years later, after many piecemeal additions and improvements, a major expansion program was carried out. Included was the world's first commercial iso-octane plant which went into production in 1938 and immediately began supplying 100-octane avgas to the British Air Ministry. The Spitfires that beat off successive attacks by the *Luftwaffe* during the Battle of Britain were largely fueled with gasoline from Pointe-à-Pierre.

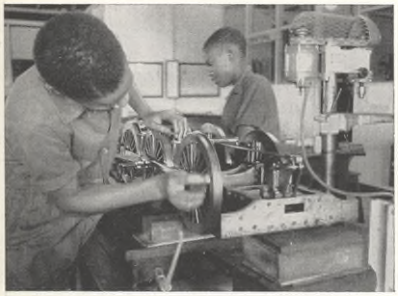
In 1952, a fluid catalytic cracking unit was added, and this Summer, an 8,000 barrel-a-day platformer (the largest in operation outside of the United States) went on stream. With refinery runs at current levels, Pointe-à-Pierre processes more crude oil than is produced by all the oil companies in Trinidad. Imports from Venezuela, Colombia, and the Middle East are necessary to make up the difference between Pointe-à-Pierre's capacity and the Island's crude oil production.

The refinery supplies half of Regent Oil Company's requirements in the United Kingdom (Texaco has a controlling interest in Regent, one of the United Kingdom's largest petroleum marketers) as well as in different markets throughout the Caribbean area.

At Pointe-à-Pierre, the extent of the refining operation is immediately evident to the visitor. Trinidad has almost no heavy industry; the machinery needed to keep the refinery running efficiently must either be brought in from the out-



A strikingly modern installation, the Pointe-à-Pierre refinery processes more crude than is produced by all oil companies on the Island



By building a scale-model locomotive this young trainee at Pointe-à-Pierre learns the fine points of shop work—an education he may put to use in the refinery, later. A loan underwritten by Texaco made it possible for the employe family below to build this comfortable new home.

side or built by the company. Importing is uncertain, however, and to reduce uncertainty the refinery maintains extensive engineering and machine shops, a foundry, repair shops, and woodworking shops at Pointe-à-Pierre. Power stations, a water works, bus and truck services are operated right on the plant site.

That the refinery has reached such a high level of self-sufficiency is a tribute both to the Trinidadian employe's eagerness to develop his skills and to the unusually thorough training programs which have been developed in order to create out of a largely agrarian population a pool of skilled industrial hands.

The training programs are divided into four categories: those for Trade Apprentices (future shop workers), Student Apprentices (potential managers), Employes (shop workers with foreman potentials), and Stenographers.

Trade Apprentices are trained in 27 different specialties, ranging from machining to motor mechanics. Student Apprentices, 16 to 21 years old, are trained over a five-year period in such courses as drilling and mechanical engineering. Instruction in mathematics, science, and other technical subjects also is given these youngsters — who are placed in supervisory jobs once they have completed their five-year training period. The Employe Training Course is designed to upgrade selected men who are considered future foreman material. This is a 12-month course, with instruction in such subjects as mathematics, English, and foremanship.

To improve the standards of Stenographers seeking employment, the company trains girls between 18 and 20 in office skills over a one-year period.

Texaco Trinidad operates its own schools at Forest Reserve and Pointe-à-Pierre. It supports Government and church schools near its operations, and makes regular scholarship awards to schools and universities in Jamaica and the United Kingdom.

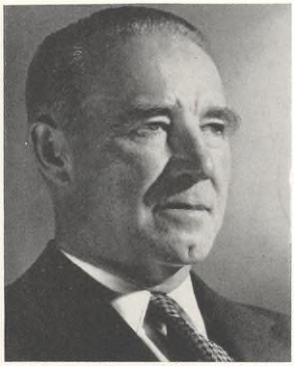
Like most fast-growing communities, the area around the Pointe-à-Pierre operations has its housing problems, and to help employes acquire adequate housing the company has established a program under which an employe may build a two- or three-bedroom home with the help of a loan underwritten by Texaco Trinidad. These homes are designed by company engineers, and are built by local contractors.

Affiliation of the Trinidad organization with Texaco has given it the additional capital needed for growth, widened its markets for refined products, and given it an increased operational flexibility. For Texaco, the acquisition has meant a broadening and strengthening of world-wide producing, refining, and marketing activities.

Texaco's Chairman of the Board of Directors, Augustus C. Long, speaking in Trinidad only a few weeks ago of Texaco Trinidad, summed up The Texas Company's optimism concerning the future in this way:

"We have made noteworthy progress during the past several years. However, we feel that there lies even greater promise in the future — with progress, growth, and development which will be of mutual benefit to Texaco Trinidad and to the people of this wonderful Island." ●

From this jetty at Pointe-à-Pierre,
petroleum products are shipped
to Great Britain, and also to Caribbean markets



OSCAR JOHN DORWIN
Senior Vice President and General Counsel

MARION J. EPLEY, JR.
Vice President and Assistant to Chairman

KERRYN KING
Vice President, Industrial and Public Relations

A New Senior Vice President, Two New Vice Presidents Elected by the Board

Election on August 29 of Oscar John Dorwin as a Senior Vice President of the Company, and Marion J. Epley, Jr., and Kerryn King as Vice Presidents, was announced September 1 by Augustus C. Long, Chairman of the Board of Directors. All three promotions were effective September 1.

Mr. Dorwin, a Director since 1957, and Vice President and General Counsel since 1951, continues as General Counsel. Mr. Epley remains Assistant to the Chairman, a position he has held since February, 1958. Mr. King had been General Manager of the Industrial and Public Relations Department since September, 1957.

A graduate with a Ph.B. degree from the University of Notre Dame, Mr. Dorwin received an LL.B. degree in 1920 from the Harvard Law School. He has been associated with Texaco since 1931, and has been General Counsel since 1944.

Mr. Epley, who was graduated from Tulane University Law School in 1930, joined the Company's Legal Department in 1947 in New Orleans, and the next year was appointed Chief Attorney in Louisiana and served in that position five years before being moved to New York as General Attorney.

Mr. King was graduated from Southern Methodist University with a B.S. degree in Journalism in 1939. Before joining Texaco as Director of Public Relations in 1953, he was senior vice president of Hill and Knowlton, Inc., public relations counsel.

Greer W. Orton Named Assistant to Chairman

Greer W. Orton, formerly Manager of The Texas Company (Iran) Ltd. with offices in London, has been appointed Assistant to the Chairman of the Board. He is succeeded in the London post by H. H. Chandler, who had been Assistant Manager.

Graduated from the University of Texas in 1927, Mr. Orton joined Texaco the following year. Since that time, he has served as Assistant to the President, General Manager of Foreign Operations and Director of various foreign subsidiaries and affiliated companies, and as Executive Assistant in New York. He has been Texaco's senior representative in London since 1954.

At the Southern Games, held in Trinidad last Spring at time of the inaugural ceremonies for new West Indies Federation, cyclists whiz past a group of fans who have made a tree their grandstand. Texaco is well known on the Island for its sponsorship of athletic events—maintains sports clubs for employes at many of its installations.

f. w. e. / 1455

Into his bell-book the ship's third mate scrawls "f.w.e." and the hour to record that the ship is finished with engines, all lines are secured, and a voyage has been completed. The f.w.e. notation in the bridge bell-book of *SS Trinidad* on July 31 (it is duplicated above, and shows the time to have been 2:55 in the afternoon) was a historic one. It noted the successful completion of the *Trinidad's* maiden voyage, from the Persian Gulf to Pointe-à-Pierre, with her first crude oil cargo. The handsome new tanker, at anchor below in Pointe-à-Pierre's submarine berth designed for offshore unloading of large tankers, is destined to complete hundreds of such missions in the years ahead—lending valuable supply support to the Trinidad operation as well as to other Texaco activities over the world. She makes a proud addition to Texaco's fast-growing tanker fleet.