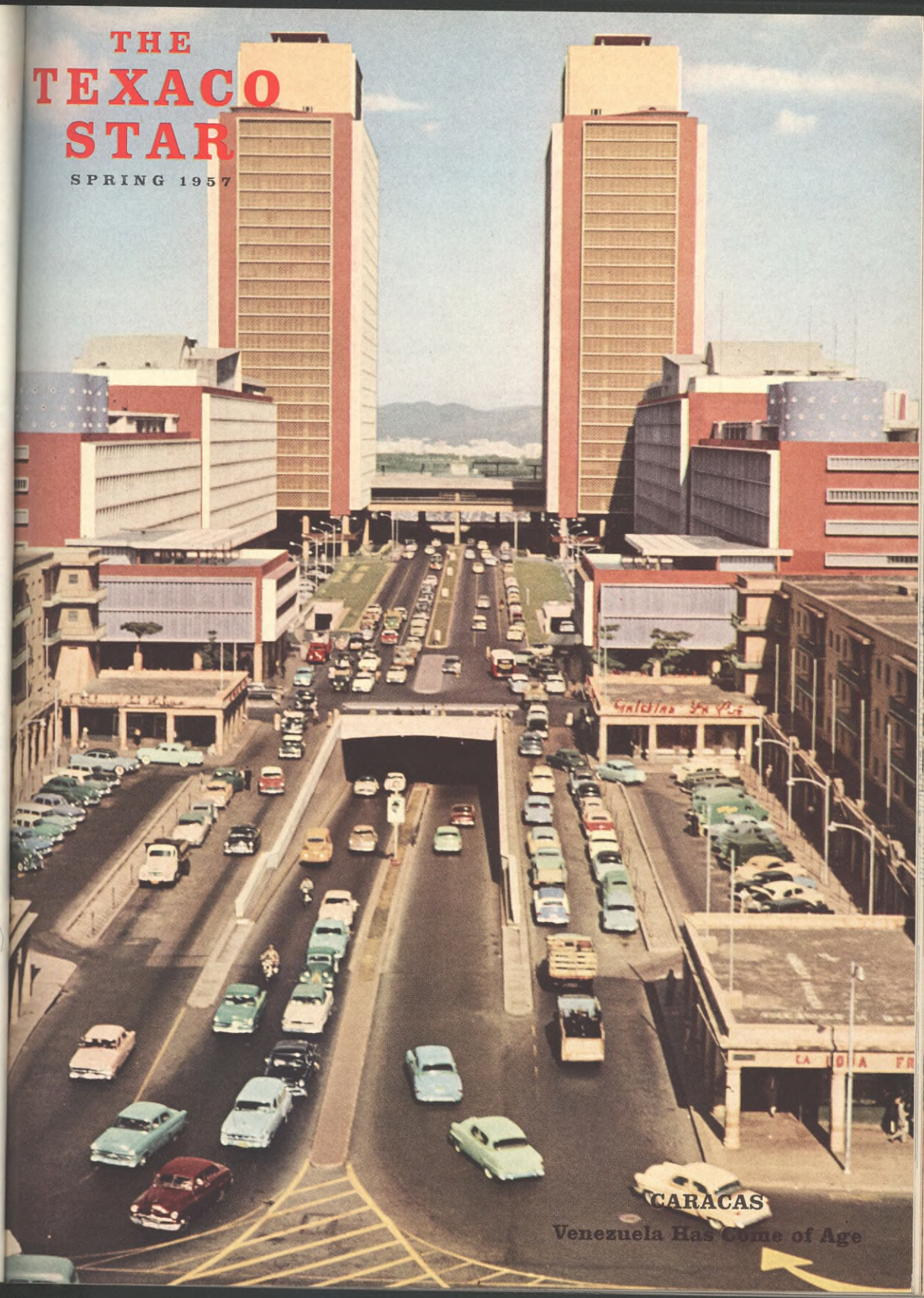
THE TEXACO STAR

SPRING 1957



CARACAS

Venezuela Has Come of Age

VENEZUELAN OPERATIONS

- TEXPET* OIL FIELDS
- LAS MERCEDES* OIL FIELDS
- ORITUPANO* OIL FIELD
- TEXPET HEADQUARTERS
- LAS MERCEDES HEADQUARTERS
- CRUDE OIL PIPE LINE (LAS MERCEDES—50% TEXACO OWNED)
- CRUDE OIL PIPE LINES (OTHER AFFILIATED)
- CRUDE OIL PIPE LINES SERVING TEXACO
- NATURAL GAS LINE (LAS MERCEDES)
- CONNECTING GAS LINE
- PAMATACUAL TERMINAL
- PALMAREJO TERMINAL (10% TEXACO OWNED)
- TERMINAL SERVING TEXACO
- TEXPET REFINERY
- VENGREF REFINERY (33⅓% TEXACO OWNED)
- MINERALS B Bauxite C Coal Io Iron Ore D Diamonds G Gold

*TEXAS PETROLEUM COMPANY (100% Texaco Owned)
#SOCIEDAD ANONIMA PETROLERA LAS MERCEDES (50% Texaco Owned)
*ORITUPANO POOLING AGREEMENT (25% Texaco Interest)

In a climate that is friendly to the investment of foreign capital, the expansion of Venezuela's oil industry and Venezuelan progress have become synonymous. Today, Venezuela's petroleum reserves are of vital importance—a fact which would undoubtedly have surprised the 15th Century explorers who gave the country its name. What interested them more than the seepages of oil they frequently came upon, were the Indian houses built on stilts above Lake Maracaibo—which prompted them to call the area "Little Venice." The pictures and text on Pages 8 through 17 show some of the impact of petroleum on Venezuela in the 20th Century.

THE TEXACO STAR

CONTENTS OF VOLUME XLIV • NUMBER 1 • SPRING 1957

THE COVER: At the turn of the century, Caracas was a drowsing colonial city of less than 100,000 citizens; today, the capital of Venezuela is one of the great metropolitan centers of the Western Hemisphere with an estimated million population. Dominating Caracas is the Centro Simón Bolívar, named in honor of the famous "Liberator" who was a native of the city. The twin towers house government offices; heavy vehicular traffic on the broad Avenida Bolívar is facilitated by an underpass.

PICTURE CREDITS: Covers—Front, inside back, back, Bernard Newman; inside front, Dick Hendler. Pages—5, 7, T. H. Redman; 8-11, Newman; 12-13, Kerryn King, Newman (13); 14-15, Newman; 17, King, Newman; 18-19, Newman; 21, Bob Bailey Studios, Leon Trice; 23, Trice; 24, Adolf Morath, Fabian Bachrach.

Co-designers—Irwin Glusker and Dick Hendler.

A publication of

THE TEXAS COMPANY *135 East 42nd Street, New York 17, N. Y.*

Published by the Industrial and Public Relations Department for Stockholders and Employes:
Kerryn King, Director of Public Relations;
Ellis Prudden, Editor, THE TEXACO STAR; **Gordon Bowman**, Staff Writer.
Printed in the U.S.A.

The Middle East emergency highlights the importance of diversifying risks in the oil industry —a factor Texaco's operating policies have always recognized

The Significance of Suez

Last Fall, free Europe was anxiously appraising the developments in a fitful Middle East. The Suez Canal had been seized by Egypt and traffic halted; the Iraq Petroleum Company's pipe lines to the Mediterranean, largest in the Middle East, had been sabotaged and were no longer operable.

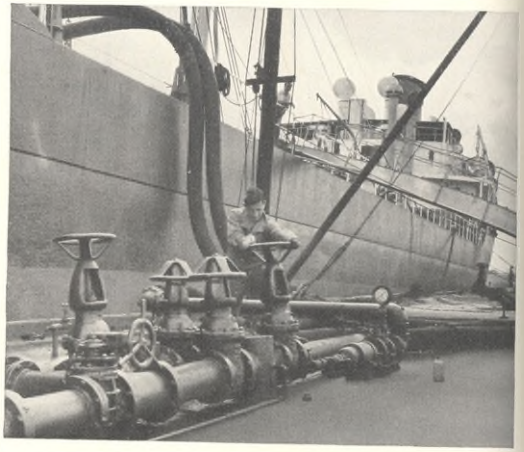
Practically overnight, supply lines were pinched off that had been feeding Western Europe with most of the 2 million barrels of Middle East oil she consumed daily. With Winter only weeks away, millions of Europeans faced the prospect of homes without heat, factories without power. About 80 per cent of their normal petroleum supply had been jeopardized.

But the heartening fact is that despite the gloomy tableau set up for them by Middle East moves, prompt action on the part of a prepared petroleum industry helped Europeans see the Winter through with more than 80 per cent of their normal oil supplies.

When the Suez crisis struck, industry leaders at once began formulating means to get emergency shipments of petroleum to Europe. Rerouting tankers around the Cape of Good Hope offered only a partial solution to the problem. There simply are not enough tankers afloat to handle the volume of oil, on the long voyage around Africa, that had been carried on the relatively short canal route. For obvious economic reasons, the world's tanker fleets are not much larger than necessary to meet normal shipping requirements—and these requirements are based largely on the use of the Suez.

As much as possible, the shortage would have to be made up from nearer Western Hemisphere points. Here, too, transportation was a problem. Tankers were available at the ports, but getting crude oil from storage to dockside was complicated by limited availabilities of pipe lines, barges, and other media used to move crude to port. Out of pressing necessity, some interesting make-do techniques were evolved. For example:

- To make up urgently needed cargoes of fuel oil for European shipment at Gulf Coast ports, and also to supply tankers with bunker fuel needed on the transatlantic crossing, 300,000 barrels of these products were rushed by Texaco in railroad tank cars from Tulsa to Houston.



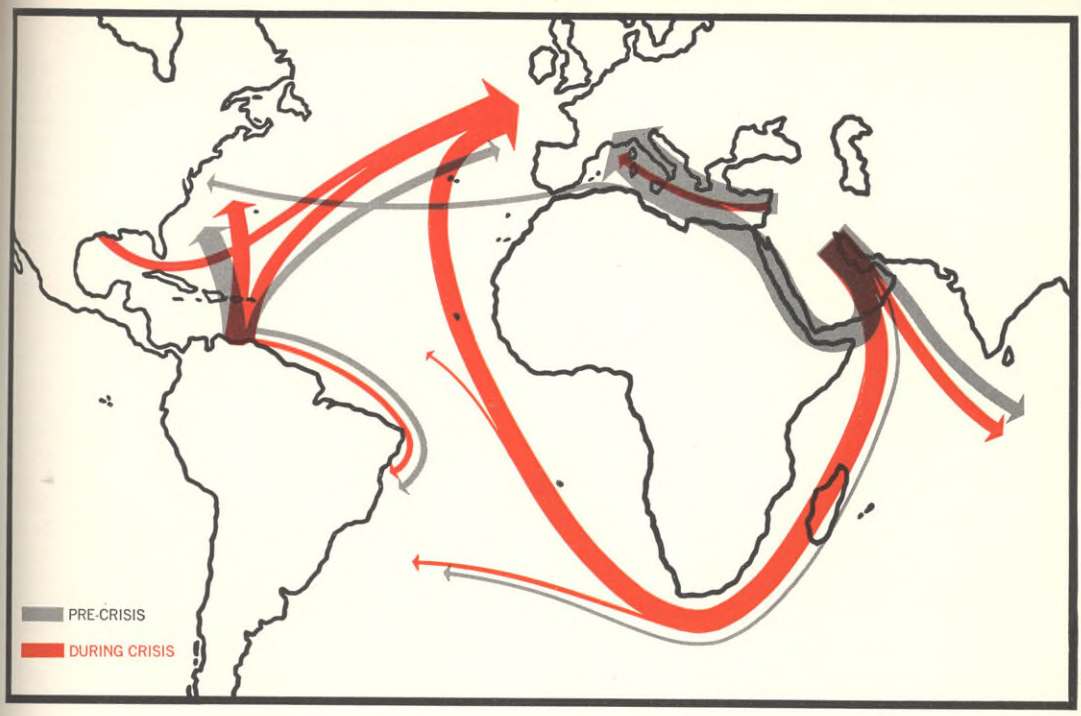
Millions of barrels of crude oil for Western Europe have been shipped from Gulf Coast ports in recent months. This loading scene is at Texaco's Galena Park Terminal in Houston.

- Normally, pipe lines carry West Texas crudes directly to the Gulf Coast area; but during the emergency, additional supplies were sent to St. Louis through a system in which Texaco participates—then barged down the Mississippi to Gulf ports. A long way around, but an ingenious solution.

Even before the Middle East Emergency Committee (a group of American oil companies, including Texaco, with interests in overseas petroleum activities) was reactivated by the Federal Government on December 3, 1956, all-out voluntary efforts to revise channels of supply to Europe were being made individually by companies in the American oil industry.

Acting upon their individual initiative with the full knowledge and encouragement of the Government, organizations like Texaco rerouted tanker movements and eliminated cross-hauls, redistributed crude and refined product supplies among their customers, and shifted refinery patterns throughout the Western world to increase supplies for Europe.

Production in Latin America was substantially stepped up. Pipe line planning was accelerated, and pipe line flows reversed to make more crude available



MAJOR FREE-WORLD OIL FLOW

When Egypt summarily seized the Suez, traditional patterns of petroleum shipments had to be redesigned all over the map. Above is a generalized impression of the "before" and the "after" of canal blockage and pipe line sabotage in Syria.

at Gulf Coast ports. Other pipe lines not then in use were reactivated.

With Government permission, load line limitations on coastwise tankers were changed to increase capacity and make available additional tonnage for transocean service; the time between drydockings for repairs and maintenance was extended.

The result of this individual action, and later cooperative effort under MEEC administration, prevented economic breakdown in Western Europe.

Pessimistic observers of the Suez crisis have asked, "Even though we're able to handle such an emergency—why ask for trouble? Wouldn't we be wiser to go elsewhere than the Middle East for our oil?"

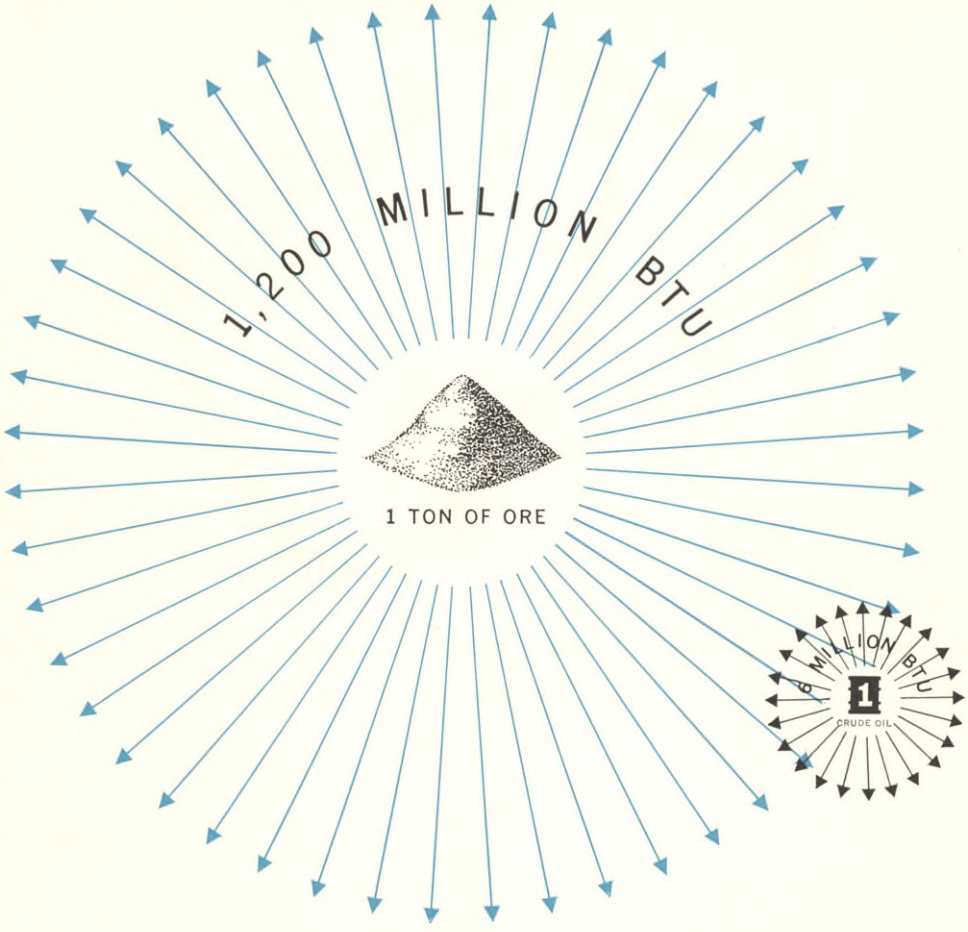
The answer, of course, is that oil companies *are* going elsewhere: exploration and production are being carried out in virtually every part of the free world. But oil is where you find it, and the fields of the Middle East hold at least three-quarters of the free world's known oil reserves. Since this is true, it is fortunate that more than half of those reserves are held by American interests, rather than by Communists or Communist-oriented groups.

Regrettably, the Suez Canal no longer can be considered a completely dependable route for oil shipments. Happily, all Texaco's eggs are not in one Suez basket.

Texaco's long-time policy has been to spread the risks of its foreign operations to the greatest possible extent—a policy in effect long before the Suez flare-up occurred. New pipe lines, terminals with greater storage capacities, *super*-supertankers all were being considered by management when the news from Egypt crackled through the free world. Included in a group of 16 tankers to be bought or chartered by Texaco is one 84,000-ton giant whose over-all length will be almost that of the *Queen Mary*.

Texaco is vitally concerned with seeing a durable and stable relationship built between the West and the Middle East. The free world needs the petroleum supplies which the Middle East can provide, and Middle East countries need oil income to push forward desperately needed economic development programs.

Texaco intends to continue its Middle East operations, then, for what are known to be sound reasons. At the same time, the Company intends to keep alert to the ever-present possibility of disruption *anywhere* and to continue developing petroleum reserves throughout the world as a safeguard against supplies from any one area being curtailed or shut off. •



The relationship between petroleum and uranium is logical and mutually beneficial

Texaco Looks at Uranium

From a teletype machine in the bustling Rockefeller Center newsroom of Associated Press, the report clattered: "Nationwide search for uranium, concentrated on the Colorado Plateau, was vigorous. . . ."

The dispatch referred to uranium exploration during 1956, and "vigorous" was an apt word choice.

Uranium has become the object of an enthusiastic search by old-time prospectors and tenderfoot vacationers alike. At the same time, it has grown increasingly interesting to thoughtful business managements, and Texaco is one of the first major petroleum companies to begin exploration for uranium ore in our western states *(see Page 7)*.

Behind this decision lie facts both sobering and provocative. Sobering is the knowledge that the rate of increase in domestic oil reserves is not keeping pace with the rise in domestic consumption. Provocative, to an organization whose business is selling energy, is the information that a dollar invested in uranium exploration stands to return substantially more salable energy than a dollar spent exploring for oil.

Careful evaluation of many facts like these, and a recognition of the fundamental precept that as a seller of energy Texaco rightly belongs in the forefront of any new energy-producing industry, led to the organization in 1956 of Texas-Zinc Minerals Corporation, owned jointly by Texaco and The New Jersey Zinc Company. Brought together in this one operating unit are the advantages of Texaco's experience in geological exploration, and New Jersey Zinc's long and successful history of mining and smelting.

Why the surge of interest in uranium? A few comparisons between petroleum and uranium ore as energy sources help explain it.

One pound of crude oil contains 20,000 units of energy (the British thermal unit is the standard used, and is abbreviated as Btu; one Btu is the heat required to raise the temperature of one pound of water by 1° Fahrenheit). One pound of uranium, though, contains 200 million Btu. So an equal weight of uranium stores *10,000 times* as much energy as does crude oil. This comparison is based on a typical crude and an ore with an average richness of six pounds of uranium per ton of ore.

In the oil industry the unit of production is the barrel; in uranium mining it is the ton. One ton of characteristic uranium ore contains 1,200 million Btu, while one barrel of crude oil holds 6 million Btu. Or put it this way: one ton of uranium ore stores an amount of energy equal to that found in 200 barrels of crude oil.

Other comparisons are just as significant to a company whose revenues come from selling energy.

A crude oil reservoir of 1 million barrels, which is

The uranium milling operations of Texas-Zinc Minerals Corporation, a Texaco affiliate (see Page 7), *are near Mexican Hat, Utah, shown in this aerial view of the San Juan River.*

Industrial expansion stimulated by nuclear power will create greater demands for petroleum

considered by oilmen to be a fair-sized field, is the rough equivalent of an ore body of 5,000 tons—looked on by uranium miners as very small, and perhaps best likened to a stripper well in the oil industry.

Plainly, uranium is a tremendously potent source of energy. How to extract that energy and put it to work on a wide-scale basis is a problem which has not yet been worked out with real practicality.

Even the most exuberant proponent of atomic power, for instance, does not see atom-driven automobiles on our highways during his lifetime. Petroleum will remain the most important single energy source for the foreseeable future.

But practical industrial applications of atomic energy are being engineered at a rate that may very well make the uranium-fueled power plant, if nothing else, commonplace within the next decade. Without diluting its strength in the petroleum industry, Texaco is making sure the Company will be profitably active in nuclear energy when the day that brings widespread nuclear power finally comes. The Company, through its part in Texas-Zinc, is making an early start to accumulate technical know-how which will be translated into broader markets in the future.

Right now the production of energy by fission is the most feasible peacetime application of atomic energy. This makes uranium ore the most logical type of energy source to seek for future reserves of fuels capable of producing atomic energy—an analysis confirmed by the fact that the Government is stimulating exploration by agreeing to the development and mining of uranium ore for the next five years, and to buy under a guaranteed price uranium concentrate for another five (current regulations stipulate that uranium concentrate can be sold *only* to the Government).

Other nuclear energy processes are appearing on the horizon, most important of which is the fusion of light elements. But although this process has been developed for military purposes, it has not been harnessed into a controllable process useful in peaceful applications. In any case, to be in the industry of *fission* today gives Texaco a head start on the road to energy creation by *fusion* if and when that process becomes feasible.

In the western region known as the Four Corners area (where Colorado, Utah, New Mexico, and Arizona join) Texas-Zinc is now actively exploring for uranium reserves. These operations provide a frame of references for comparisons between energy values in which uranium is found and those in which petroleum occurs:

- One cubic foot of typical uranium-bearing rock holds *1,700 times* as much recoverable energy as a cubic foot of typical oil-bearing rock.
- Assume a uranium deposit contains 500 trillion Btu. If the ore occurred in a pay thickness of 10 feet the ore body would cover an area of 13 acres. To provide that same energy from an oil field, your reservoir, with a 20-foot pay thickness, would cover an area 1,000 times that of the ore body.
- Under favorable conditions, one dollar spent in the search for oil can find 100 million Btu. Under conditions favorable to the location of uranium, one dollar spent in the search for uranium can uncover 1,300 million Btu. While such a comparison is relative and dependent upon many factors, it is clear that it is possible for a dollar spent in uranium exploration to lead to the discovery of more energy than a dollar spent on oil exploration.

Although the origin of uranium deposits differs from that of petroleum reserves, the men in uranium exploration are learning more and more to apply the thinking of petroleum geologists. Oil geologists are used to exploring for structure rather than for oil, and uranium geologists have taken the clue from oilmen; they're learning to use this indirect method when they look for ore.

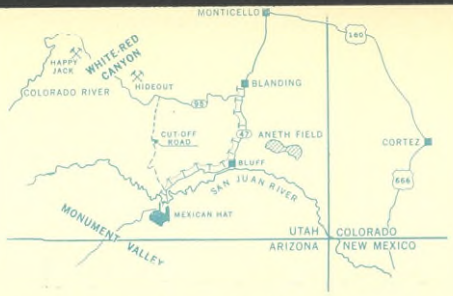
Current uranium production is at the rate of about 6 million tons a year, which is enough uranium ore to produce 8 million billion Btu annually. The total proven reserves of uranium in the United States are presently put at 60 million tons. On the other hand, total domestic petroleum reserves at the end of 1956 were about 37 billion barrels. From an energy point of view, this is equivalent to 180 million tons of uranium ore. So the energy in our proven oil reserves is only three times that of the known uranium reserves.

Because it is so young as a practical energy source, uranium's almost limitless potential still is relatively uncharted and its ultimate character and usefulness unknown. Petroleum has reached that point in its career where its tremendous versatility more than counterbalances lesser reserves of energy. Undoubtedly, each will gain strength from the other—making the relationship between petroleum and uranium eminently logical and mutually beneficial in the future.

All signs point to the fact that future energy requirements will be so great that nuclear power will be needed to supplement, rather than supplant, traditional fuels and power sources. In fact, it is probable that atomic energy will stimulate such a new wave of industrial expansion that an even greater demand will be created for petroleum products.

Texaco is looking into the possibilities of uranium, while adding to its stature as a supplier of petroleum, in order to pave the way for what promises to be a profitable future alliance. •

URANIUM OPERATIONS NOW UNDER WAY...



Traveling by jeep and plane over the southern section of the Colorado plateau, instrument-armed geologists of Texas-Zinc Minerals Corporation, a Texaco affiliate, scour weird rock formations for telltale signs of uranium ore.

Several hundred years ago Navajo and Ute hunting parties took their ponies over the same wild landscape, looking for the same ore. They had found it produced fiercely impressive red and yellow war paints to smear on their bodies. The Texaco affiliate's crews know it also yields a powerful new energy source: uranium.

Heaviest exploration activity of Texas-Zinc is in Utah, in the area around Mexican Hat (the name comes from the sombrero-like shape of a large mesa nearby). A few miles to the south, crews also are picking their way through rugged Monument Valley on the Arizona-Utah border. Using Geiger counters and other scientific apparatus, they take ore samples from some of the most spectacular natural formations in North America—one of the first steps in Texaco's uranium hunt.

Uranium deposits usually are found a few hundred feet above the slick, whitish bands of sandstone that ribbon through the mesas in this area. Some deposits are bright yellow, others pale green or gray. Still others are tinged brown with iron stains.

Interestingly, the land on which Texas-Zinc has begun operations is part of a Navajo reservation. Arrangements were made with the Navajo tribal council so that Navajos will be employed on those jobs they are qualified to do, or can quickly be trained to do.

While exploration is being carried on, uranium is being mined at the Happy Jack holdings in the White Canyon *(see map)*. In addition to milling ore from its own mines, Texas-Zinc will process ores bought from independent mines in the Mexican Hat area, which has become a center of uranium exploration and mining activities.

Texas-Zinc has purchased a substantial interest in the White Canyon Mining Company. It has extensive holdings within commercial trucking range of the Mexican Hat mill. Its Hideout mine is a substantial producer.

About 125 men will be employed when full production is reached at the mill and at the Happy Jack. A small community is being built at the mill site to house employes and their families.

One of the problems in the setting up of the Mexican Hat mill and community was the lack of a short shipping road from the Texas-Zinc's mines in the White Canyon to the operations at Mexican Hat. Texas-Zinc is building a 40-mile highway with a spectacular cut, across a steep cliff eight miles north of Mexican Hat. Texas-Zinc also is constructing a 60-mile power line from Blanding through Bluff to the mill. This electrical power system will not only service the plant and township, it will open power possibilities to other potential users. For example, the Aneth field—a prolific Texaco oil producer—may be electrified through this system.

Building material and other supplies for the mill and community must be trucked more than 100 miles from the railroad at Thompson, Utah. Uranium concentrates sold to the Atomic Energy Commission will be trucked from the mill along the same route for transshipment to Thompson.

E. R. Filley, Vice President in charge of Texaco's Domestic Producing Department, is a director and the president of Texas-Zinc Minerals Corporation; Gerhard Herzog, Assistant General Manager of the Research and Technical Department, is a director and vice president; S. T. Crossland, Vice President and Treasurer of Texaco, is treasurer, and J. H. Rambin, Jr., Assistant to Vice President, Texaco's Domestic Producing Department, is a director.

Happy Jack and other mines are along base of cliff, upper right; at lower left, the Government ore-buying station.

Mill at Mexican Hat is under construction, left; in center are trailers, housing construction workers; right, employe homes.

VENEZUELA P

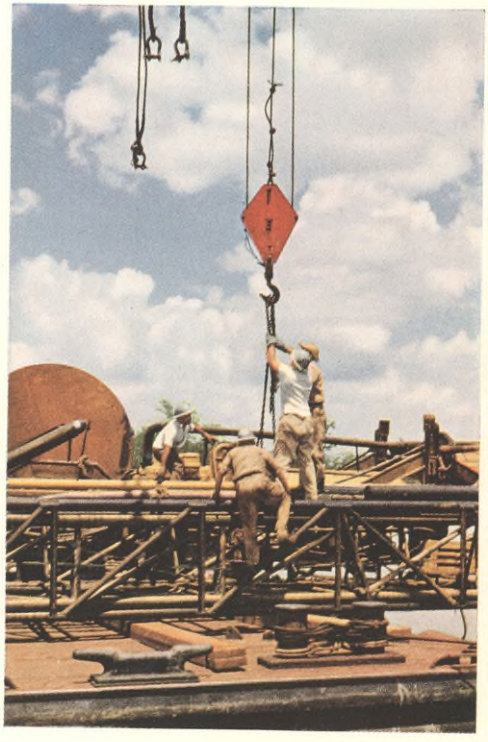
Brilliant mosaics of tile, glass and cement, these housing projects are typical of dozens skirting Caracas. In the last decade, petroleum revenues have made Caracas one of the most modern cities in the world.

Former perfume salesman Miguel Hernández now has a job with a more promising future, thanks to petroleum. He is supervisor of the tanker-loading crew at Pamatacual Terminal.

A: PETROLEUM AT WORK

Barged up the Mánamo River, this equipment will be used in looking for oil in the Tucupita marshlands. Heavy rains and low flood plains which are under water most of the year turn oilmen into part-time sailors.

At the Las Mercedes field, Venezuelans help set up a rig. This is the world's second largest oil-producing country.



Placid Pamatacual is land's end for Venezuelan oil. Here a tanker, resting comfortably, is being filled with crude before starting her long voyage to a refinery.

CONTINUED ►

Self-powered barges, called "bongos," nudge a larger barge loaded with drilling equipment into the grassy bank of the Mánamo River at Tucupita. This is a new drilling site, and all equipment must be hauled from a point that is 11 hours away on the river.

The Las Mercedes concession reminds oilmen of Rio Grande country in West Texas. Here a portable drilling mast is being swung by trailer-truck to a spot in which a rig will be set up. When erected, the mast will stand 137 feet high.

Producing oil in Venezuela meant
a struggle against staggering natural obstacles.
It was...

THE FIGHT EVERYBODY WON

In few areas of the world has nature so grudgingly shared her oil larder with man as in Venezuela. A patchwork of roadless desert, swamp, and mountain blocked any substantial oil production for decades after the first commercial operations in 1878.

Yet, modern producing techniques manage to coax enough oil from Venezuela today to make it the second largest producing country on earth, supplying more than 15 per cent of the free world's total output. In the last 20 years oil has come to represent more than 90 per cent of the value of Venezuela's total exports. Government revenues from petroleum have enabled a nation which, at the start of the century, was desperately poor to become the wealthiest in South America.

By sticking it out and applying experience gained in other rugged areas to the special problems here, Texaco has developed in Venezuela its greatest Latin American crude source.

Bringing oil to Venezuela's surface was a formidable job in the early days—which actually continued through the late '30s and into the early '40s.

When the oil companies first began moving into Eastern and Central Venezuela, there were no roads passable year-round. And as recently as 1947, one old Venezuela hand remembers, a 200-mile trip could mean two days of driving over cattle trails, arid mesas, and makeshift corduroy roads. At that, travel usually was possible only six or eight months of the year.

During the rainy season most field work was out of the question, except on the mesas (these table-flat formations can be as much as 100 miles square). Old-timers talk about one little clutch of Indian huts on the edge of badlands leading to a drill site. The village was named Sal Si Puedes. Translation: go on if you can.

Until 1947, there were only two hard-surfaced roads in all of Eastern Venezuela. Oilmen relied heavily on airplanes to move personnel, food, and equipment from one place to another. The long, bare mesa country was one mammoth airport during the years before roads began threading across it.

Exploration and producing crews living in this tan-

Taking time out for coffee, supervisor surveys a well site in Tucupita field while 'dozer goes on clearing cane grass.

At Tucupita this bulldozer will clear a roadway to well site. Like other equipment, it had to be barged to the field.

VENEZUELA

THE FIGHT EVERYBODY WON *(CONTINUED)*

gle of jungle, semidesert, and swamp had rough going. Dysentery was a major worry. Both cooking and drinking water had to be chlorinated. In one region, pernicious malaria nagged the crews. Local nationals called this disease *fiebre económica*, or "economical fever" (if you came down with it, you wouldn't last long enough to pay your doctor bill).

Today, conditions are much different for oil workers in Venezuela. Paved roads extend to principal producing areas. Only in wildcatting areas does producing today remind one of 10 years ago. The road network was constructed with the assistance of oil companies as one of the first steps in a program to make oil production feasible in a country where nature sometimes seemed downright spiteful. Other conditions have changed, too.

At the Roblecito camp on the Las Mercedes concession, employes live in comfortable homes, receive the best medical care in a company-managed hospital. On their days off the men often hunt deer, duck, tigers, and quail, which are plentiful in this region.

Through Texas Petroleum Company – a wholly owned subsidiary–Texaco now produces about 23 million barrels of oil a year from a dozen Venezuelan fields. Texaco's first discovery well was completed in 1940, near Tucupita.

Rain and flood remain tough adversaries at Tucupita. In six months, rainfall may total 100 inches. New Yorkers, perhaps the most umbrella-conscious group in the United States, receive a mere sprinkling by comparison: about 20 inches in an average half-year.

Tucupita's most reliable roads during the rainy season are water channels, much like Louisiana's bayous, which wind through the dripping jungle.

From May to November drilling crews often use motorboats to reach their working sites. Drilling rigs are designed with the derrick floors about 16 feet above ground–high enough to avoid flooding. Even houses and offices at Tucupita perch on stilts, and all installations are circled with dikes.

Self-propelled barges called "bongos" are used in Tucupita to haul drilling equipment to the well sites. For barge and drilling crews, getting to a wildcat well often means an all-day trip through miles of twisting river channels.

In a drier section of Venezuela, on the plains of Guárico, Texaco is producing oil on the Las Mercedes acreage–owned 50 per cent by the Company–under more familiar circumstances.

American oilmen who have seen the land in the 800,000-acre Las Mercedes concession say it reminds them of the Rio Grande area in West Texas. During the dry season here, trucks trace choking clouds of dust along the roads as they haul equipment to drilling sites.

At Puerto la Cruz, crude from Las Mercedes is processed to make a full line of fuels in refinery one-third Texaco owned.

With the completion in 1948 of a 158-mile pipe line from Las Mercedes to Pamatacual Terminal on the Caribbean, Texaco began to ship Venezuelan crude to markets in the Western Hemisphere.

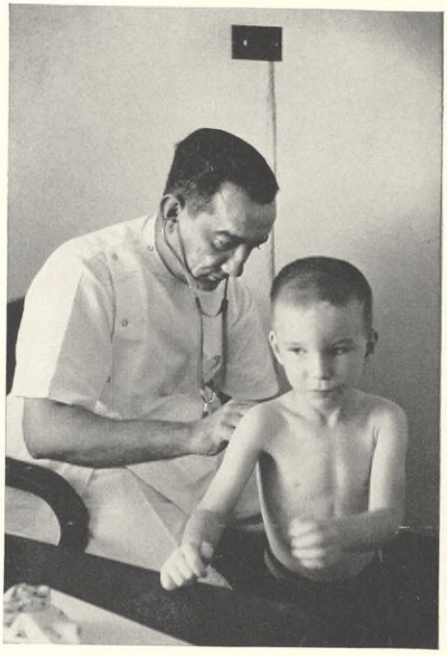
Natural gas produced at Mercedes is transported by pipe line more than 100 miles to the booming industrial area near Caracas. The daily volume pushed through this line (55 million cubic feet) makes it one of the two largest in Venezuela.

Much of the petroleum Texaco produces in Venezuela is refined into products within the country before it is exported. About 20,000 barrels of crude are pipelined daily from Las Mercedes to Puerto la Cruz. At Puerto la Cruz the oil is processed by the Venezuela Gulf Refining Company, owned one-third by Texaco.

Tucupita crude is processed into fuel oil at the field's refinery, then shipped by barges down the Mánamo River to the Gulf of Paria and Trinidad. At Trinidad, it is loaded on tankers that carry it to other Latin American countries.

A substantial volume of Texaco's Venezuelan crude goes to The Trinidad Oil Company Limited, the Company's recently acquired subsidiary, for processing.

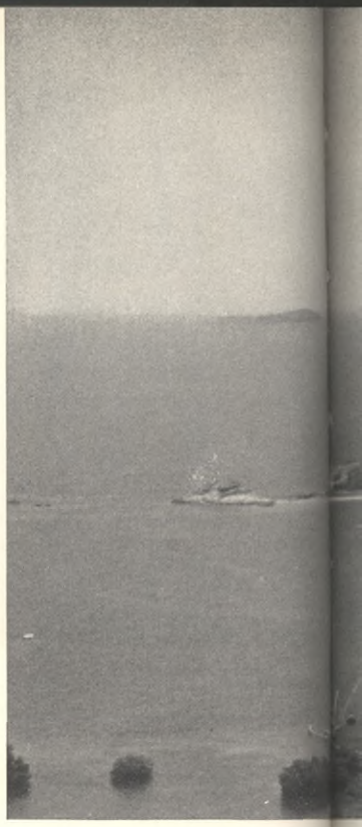
Producing in Venezuela today, say the crews working there, is not particularly tough. But the fight to get started was a long, hard one. Happily, everybody won: the Venezuelans, Texaco, and an oil-hungry world.

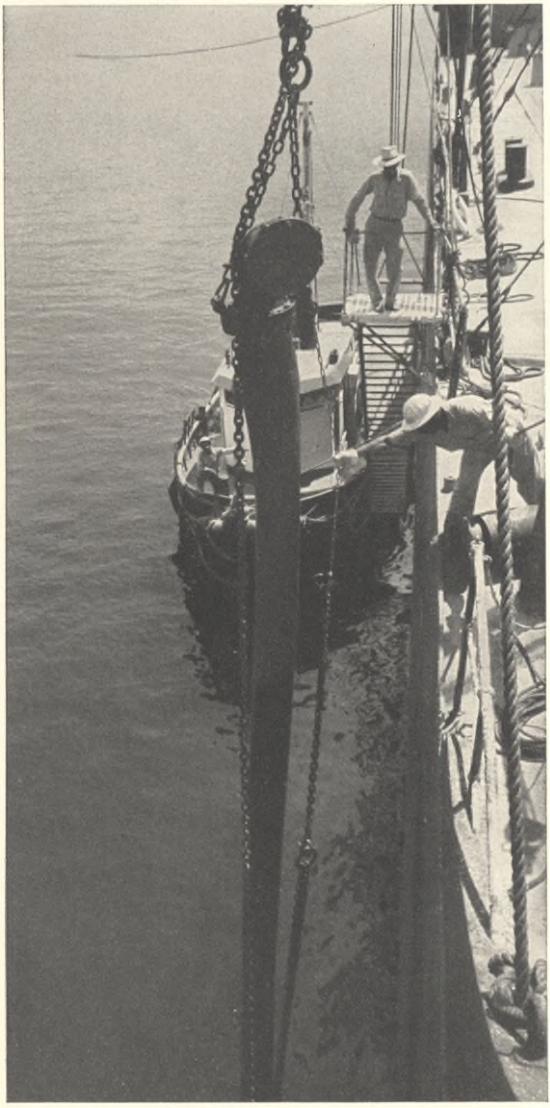


Medical care for employes at Roblecito camp on the Las Mercedes concession is under the direction of Dr. Luis Dao (above), *a Venezuelan. The significant strides being made in health improvement throughout the country are reflected in medical service given here.*

VENEZUELA

Circling around Silver Island (center) *into the deep blue harbor of Pamatacual, a tanker strings a sparkling plume behind her as she glides to anchorage. Buildings in the foreground are part of the terminal camp. To load a tanker of this size takes six hours.*





From the harbor floor, 75 feet below, a 10-inch rubber sea-loading line is hoisted to the tanker's deck. Miguel Hernández (in wide-brimmed hat), *who supervises crew of Venezuelans that handles loadings, watches at head of gangway. Through the loading line, into the ship's cargo tanks, will pour 120,000 barrels of crude.*

In the communications shack at Pamatacual, Hernández calls pump station at Mercedes via radio hookup.

Hose that joins underwater line with tanker's manifold is kept ashore, transported to ship at loading time.

DOWN TO THE SEA—INTO TANKERS

Busy Pamatacual Terminal takes on new importance because of recent Middle East developments

One of the ocean terminals serving Texaco in Venezuela is situated at Pamatacual, on the northeast coast. About half a million barrels of crude oil are fed into tankers at Pamatacual monthly. The loadings are handled by Venezuelan nationals, with 35-year-old Miguel Hernández in charge.

Before he became an oilman, Hernández was a door-to-door perfume salesman. By becoming part of his nation's most important industry he has, like thousands of his compatriots, learned new technical skills and increased his value as an employe. The shift from perfume to petroleum has meant a new life with a better future for Miguel Hernández and his family.

To load a tanker with 120,000 barrels of crude is a six-hour job. First, though, the sea water used to ballast the ship during its ocean run to Pamatacual must be emptied from its tanks—and this takes about four hours. Hernández and his crew carry out the loading job with the quiet efficiency that comes with experience. The photos on these pages follow him and his men through some of the loading steps.

In recent months the work at Pamatacual has taken on new significance. With seizure of the Suez Canal and disruption of pipe lines across Syria, the availability of oil in the Western Hemisphere became more vital than ever to the United States and Western Europe.

COMING OF AGE

In the last 20 years Venezuela has become one of the most advanced nations in Latin America—a spectacular growth nourished by petroleum

To explain the almost straight-up charting of Venezuela's growth in international stature during the last 20 years, economists point straight down—to the vast fields of oil lying beneath its surface.

Virtually every one of the many dramatic advances Venezuela has made since the late '30s is rooted in petroleum. Knowing observers see an oil derrick straddling each new superhighway, standing behind every new school and hospital and housing project in a country where construction of all types is being pushed ahead at a rate that dazzles.

Largest exporter of petroleum in the world today, Venezuela last year earned about $600 million from income taxes, export duties, and royalties growing out of oil production, and received more than $350 million from the granting of new concession areas. Wisely, the government plows back the bulk of these revenues into public works projects, and encourages foreign corporations to invest in new industries and facilities (the book value of U.S. direct investments now totals more than $1.5 billion). The result is that on a per capita basis Venezuela currently is the wealthiest of all Latin American nations.

To anyone who has not followed the progress of this country during the last two decades, the signposts are eye-openers. Since 1936 total gross national product has increased more than three-and-a-half times—it now is at an annual rate of about $4.5 billion. Generation of electric power has increased more than 10 times since 1938. In 20 years, employment has been upped by 50 per cent.

The capital city of Caracas is the showcase for Venezuelan progress, and some of the most arresting architecture anywhere is seen here.

At the new University City in Caracas daring uses of line, form, and space in the designs of the gleaming new campus buildings create an exciting sense of modernity. Six years ago, the campus was a rice field.

Approaches to Caracas are ribboned with express highways, cannily engineered to allow for the traffic flow predicted for 20 years in the future. Elegant shops and restaurants fill the business district, making Caracas one of the most cosmopolitan cities in the Western Hemisphere.

What the average *turista* doesn't see is the progress being made outside Caracas. Literacy rates throughout the country have been tremendously raised during the last 20 years. In 1951, a 10-year school building program was instituted, calling for an average of 50 new schools a year. Largely because of petroleum revenues, huge strides have been made in public health. The infant mortality rate has been cut in half since 1938. There has been almost complete success in the control of malaria and smallpox.

Agricultural development is being pushed hard by a country historically poor in good farmland. One vital new project is an irrigation system that will eventually bring 250,000 acres of marginal land in the semiarid *llanos* to the point where it can be farmed commercially.

The industrial progress of the nation is served, to a substantial degree, by Texaco—which supplies lubricants to rubber tire plants, iron ore mines, power plants, and for road building and construction projects.

Subtle or striking, advances are being made with remarkable speed in Venezuela. Petroleum is the base for this coming-of-age, and oil operations such as Texaco's contribute greatly to it.

Caracas is the showplace for Venezuelan progress, and has become one of the most cosmopolitan cities in the world—surrounded by superhighways, studded with attractive buildings. Petroleum revenues have been responsible for virtually all Venezuela's recent advances.

In a fashionable section of Caracas, new apartment houses reflect Venezuelan vivacity and warmth. Almost an entire wall of the building in foreground is covered with a colorful, expressionistic mural.

Only link between houseboats and outside world is a PBY flying boat (far left). *Men pass spare time with cards, chess* (left), *movie once a week. Picking their way across catwalk* (lower left), *crew members go from one houseboat to second one in right background. River is swollen 16 feet above normal, and drilling is temporarily suspended.*

Houseboat on the Marañón

Along the banks of Peru's broad and roiling Marañón River, about five degrees below the equator in a jungle area few outsiders ever penetrate, Texaco is probing the soggy earth for new signs of petroleum.

Texas Petroleum Company is leading the search for oil along the inland waters of Peru's *Oriente*. In a 2.5-million-acre concession there, exploratory drilling is under way at a point where geophysicists have decided the structure looks favorable.

Linked with the civilization that lies beyond the Andes to the west only by the Company amphibian which flies in food and supplies, some 50 exploration crewmembers make houseboats their homes in this steaming isolation.

Two years ago the houseboats were towed from Trinidad along the hump of South America to Belém, Brazil, and then 1,950 miles up the Amazon and *Río Marañón*. Drilling rigs and other equipment were brought in aboard a converted LSM from Houston, Texas. The floating river-town contains an infirmary, kitchens, a fresh-water supply, an office, sleeping quarters, and recreation rooms.

When the crew spots the flying boat coming in over the camp site—it usually shows up twice weekly—every man waits eagerly for it to touch down on the muddy, racing river and skim to a stop.

The plane's arrival means mail from home and the chance to pick up the latest news from "outside." Except for *plátano*, bananas, and rice bought from Indians along the river, everything the crew needs for these operations is brought in by the Texaco PBY.

The big social event every week is "movie night," when a number of Indians usually are guests of the crew. Some of the Indians paddle up the Marañón from as far as Iquitos, eight hours away, for the showings. Most popular are American cowboy pictures.

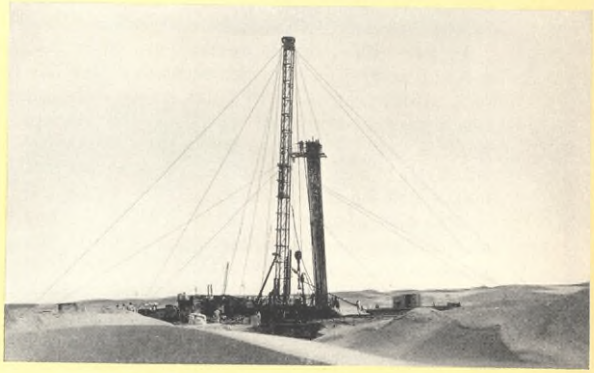
Texaco has been exploring the Marañón River valley since 1954. Heavy rains (average annual fall is 300 inches) often cause floods that halt operations; when the photos on these pages were taken work had been stopped because the Marañón was swollen 16 feet above normal.

Although the Marañón region is a tangled, watery wasteland, Texaco considers the prospects promising enough to continue the search there. •

Nestled to the jungle edge, houseboats are headquarters for a handful of Texaco oilmen exploring Peru's wilderness for a new source of petroleum. Drilling rig and other equipment used here were carried by a converted LSM over more than 5,000 miles of ocean and river from Houston, Texas.

DESERT SEARCH

In the Sechura Desert, five miles inland from the Pacific at the northern tip of Peru, hard sandstone makes drilling for oil slow (one foot an hour) work. Crews working here live in trailers on the desert, or in nearby Indian villages. Only five degrees below the equator, the Sechura is bone-dry and blistered, its contours constantly worried by winds that whistle in from the ocean. Sandstorms turn day into twilight, and shroud the landscape in a gritty mist. Below is the rig drilling Texaco's third wildcat well in the Sechura.



REGULATION OF PRODUCERS' NATURAL GAS PRICES

Is Anyone Benefiting?

The current FPC muddle graphically shows what happens when bureaucracy intrudes on free competition. It makes producing natural gas a discouraging proposition

In the Land of the Big Risk—across Oklahoma, down into Texas, and east to Louisiana—men whose business is taking chances on finding natural gas are losing their willingness to gamble.

Trouble is, they say, a man doesn't know these days what he is risking his money *for*.

Their waning enthusiasm carries serious implications for the nation's gas consumers, because these men drill 80 per cent of the gas wells and have been finding about two out of three new gas fields. They are the small producers who at their own risk look for new supplies of natural gas and, when a gas field is found, develop it.

"I'm a gambler by nature, or I wouldn't be in this business," drawls one Texas wildcatter. "But, man, I can't cover odds like these."

The odds he talks about are staggering.

In July, 1954, the Supreme Court ruled that field sales of natural gas by a producer to a pipe line company which transports that gas across state lines for resale must be regulated by the Federal Power Commission under the Natural Gas Act. The immediate effect was to create a public utility type of control which makes even an individual producer a "gas company."

This type of price regulation ignores the fact that although gas has a value as a commodity—like corn, cotton, iron ore, and coal—there are also tremendous risks inherent in the hazardous and highly competitive business of finding and producing natural gas.

Since a reluctant FPC took on the assignment of regulating producer prices, the proposition of making a reasonable profit on the discovery and development of natural gas has become a discouraging one for the producer.

To understand the hardship one must look at the structure of FPC regulation. Briefly, it is this: before a producer can start selling his gas he must file his contract in Washington as a "rate schedule" and obtain a Certificate of Public Convenience and Necessity authorizing the sale. Often it requires a year or two before a certificate is issued.

In some cases he may start deliveries at once; but if he does, he takes the chance that when the permanent certificate is issued it may call for a sales price lower than the one originally agreed on—and he must be ready to refund the difference between the contract price and the price specified in the certificate.

What's more, since the Commission has the authority at any time to reduce the contract prices (after proper hearing), the producer can *never* be sure what price he is going to get for his gas.

And once he starts delivering under his contract, he cannot stop until the Commission allows him to—even though the contract has expired.

Not many small producers can afford to enter into such a shaky arrangement. Fewer and fewer do.

In the Oil Center at Lafayette, Louisiana, Drew Cornell succinctly states his case: "I just can't wait for FPC. When I make a discovery, I have to find a market right away, because the bank's sighting right down my nose to get its money back. Sure, I'm doing my best to get out of natural gas."

Although the producer may have come to his current work from any sort of background (some used to be executives in other businesses, many hauled themselves up from early roughnecking days, a surprising number hold college degrees in one field or another), each one is characterized by an urge to move fast and let someone else worry about the paperwork.

This, under Washington control, is palpably impossible. The amount of paperwork necessary to get a contract through the bureaucratic maze is monumental.

"When regulation first came in," Cornell says, "it cost me three hundred and seventy dollars just to ship all the papers Washington wanted."

But paperwork, even though it's a nuisance and an expensive one, isn't the biggest deterrent to new gas field development. What has curbed the producer's enthusiasm more than anything else is the hard-headed realization that he can't afford to tie up his huge investment during the one-to-two-year wait for an FPC decision on the deal he makes with an interstate pipe line company.

Sipping thick black coffee on the porch of his combination home and office near New Orleans, Temple Hargrove—whose business career began in 1919 when he signed on as a roughneck in an Oklahoma oil field—explains why he has lost interest in natural gas.

"The gas we're finding today," Hargrove says, "is mostly on the flanks of proven fields. It's becoming more and more expensive to find. We used to hit it at three thousand feet; now we're looking at ten or even fourteen thousand. The small producer can't go it alone, and often he can't get the financing he needs because he can't promise a backer how much he expects to make on a new well. He doesn't know himself, for sure."

There are three moves a producer can make to sidestep the FPC tangle: stop leasing land which appears to be more prospective for gas than oil; find an *intra*state market for the gas he discovers; simply shut in a new gas field. All three alternatives are becoming common in the Southwest.

The buying of leases for gas exploration has slackened very noticeably during the last two years, and burly New Orleans operator "Monte" H. T. Shalett of the Berkshire Oil Company tells why: "The workload and uncertainty a gas deal creates just aren't worth it," Shalett says. "If we knew today we could buy a lease with nothing but gas on it, we wouldn't touch it. A new gas deal means sending a lawyer to Washington, spending weeks trying to figure what the FPC wants—and then a long wait before you get your money back. Seems to me when you buy something you ought to know what return you're going to get on your investment, and how soon. You don't when you're in a gas deal, nowadays."

"In royalty sales these days," a Texas operator claims, "the first thing they ask you is whether it's gas or oil. If it's gas, you're going to have a hard time selling. I know I quit buying gas royalties—and that hits the farmer, 'cause he needs the money." The Texan's ob-

WHAT THE SMALL PRODUCERS ARE SAYING...

Fred W. Bates,
Lafayette, Louisiana
"The small independent can't afford to have his money tied up in a gas deal for a year or two—he has to keep it working. Most of the men I talk to say they're staying away from natural gas these days, for that reason."

Drew Cornell,
Lafayette, Louisiana
"I just can't wait for the FPC. When I make a discovery, I have to find a market right away . . . sure, I'm getting out of natural gas."

H. T. Shalett,
New Orleans
"If we knew today we could buy a lease with nothing on it but gas, we wouldn't touch it . . . as far as I'm concerned, the workload and uncertainty just aren't worth it."

Temple Hargrove,
New Orleans
"The average small producer can't go it alone, and often he can't get financing he needs because he can't promise a backer how much he expects to make on a new well. The producer doesn't know himself, for sure."

Producer, pipeliner, distributor—all are stymied by FPC red tape. The outlook is grim for consumers

servations are backed by the same kind of comment all through the area. Not many investors are anxious to become involved in a gas venture whose outcome is made uncertain by the FPC snarl.

Finding an intrastate market for his gas is one way a producer can avoid the FPC muddle and receive what he thinks is a fair return on his investment, and producers in the Southwest are naturally interested in intrastate contracts when they can be made. Evidence of this is easy to find in Texas, where an increasing amount of natural gas is being sold within the state to operators of petrochemical plants.

More than half of the natural gas being produced in Texas now is marketed within the state's borders, and the list of manufacturers who have moved their facilities to Texas—or have opened new installations there—keeps growing. At the end of 1956, Texas led the country in new construction of petrochemical plants, voracious users of natural gas.

But it's not always possible for the producer to find an intrastate market. Sometimes he is forced to make sales which bring him under FPC control, or just shut in new wells until he can find an intrastate buyer or Congress changes the present unrealistic producer price regulation.

Shutting in is not a satisfactory solution, of course: it simply holds up sales the producer needs to earn his living. Still, in the Lafayette parish of Louisiana, six substantial fields within an eight-mile radius of the town of Lafayette have been shut in during recent months.

The producers who own these fields are virtually forced to forget that property as an income source. This in spite of the fact that they have sunk many thousands of dollars into the development of the shut-in fields. They would like nothing better than to sell their gas. But they do not want to become entangled in the unsound business situation FPC regulation creates for them.

What of the larger producers, meanwhile? How has FPC regulation affected them? Here, too, the picture is one of lost time, added expense, a dizzying pile of paperwork—and uncertainty over revenues.

Making the rounds of Houston's Petroleum Club recently was one example of what can happen when a large producer falls into the FPC pit.

The story, and it's a true one, is that a producer signed a 20-year gas sales contract with a pipe line company involving the delivery of 78 million cubic feet of gas a day (50 million cubic feet is considered a huge delivery). An application was filed with FPC in December, 1954. Hearings were held in the Spring of 1955, and continued through 1956.

A certificate finally was recommended by the FPC examiner in December of last year—almost two years to the day after the filing of the original rate schedule—yet, up until now, the way still has not been cleared for the sale of this gas. Meantime, the producer has been kept under fire by unhappy landowners who are receiving no royalties.

This sad chronicle points up the fact that it is regulation itself, and the confusion surrounding it, that stands to keep natural gas from the consumer.

Certainly the producer is eager to realize income from his natural gas reserves, and the pipe line company is anxious to buy the gas and transport it to the distributor. The distributor needs it to meet his market demands (there are still restrictions on house-heating in some consuming areas, because of distributors' supply limitations). Yet each of these three is stymied by the choking tangle of red tape that hampers the producer and tends to keep his gas off the interstate market.

In Texaco's New Orleans headquarters, one finds a striking example of the clerical burden regulation can create.

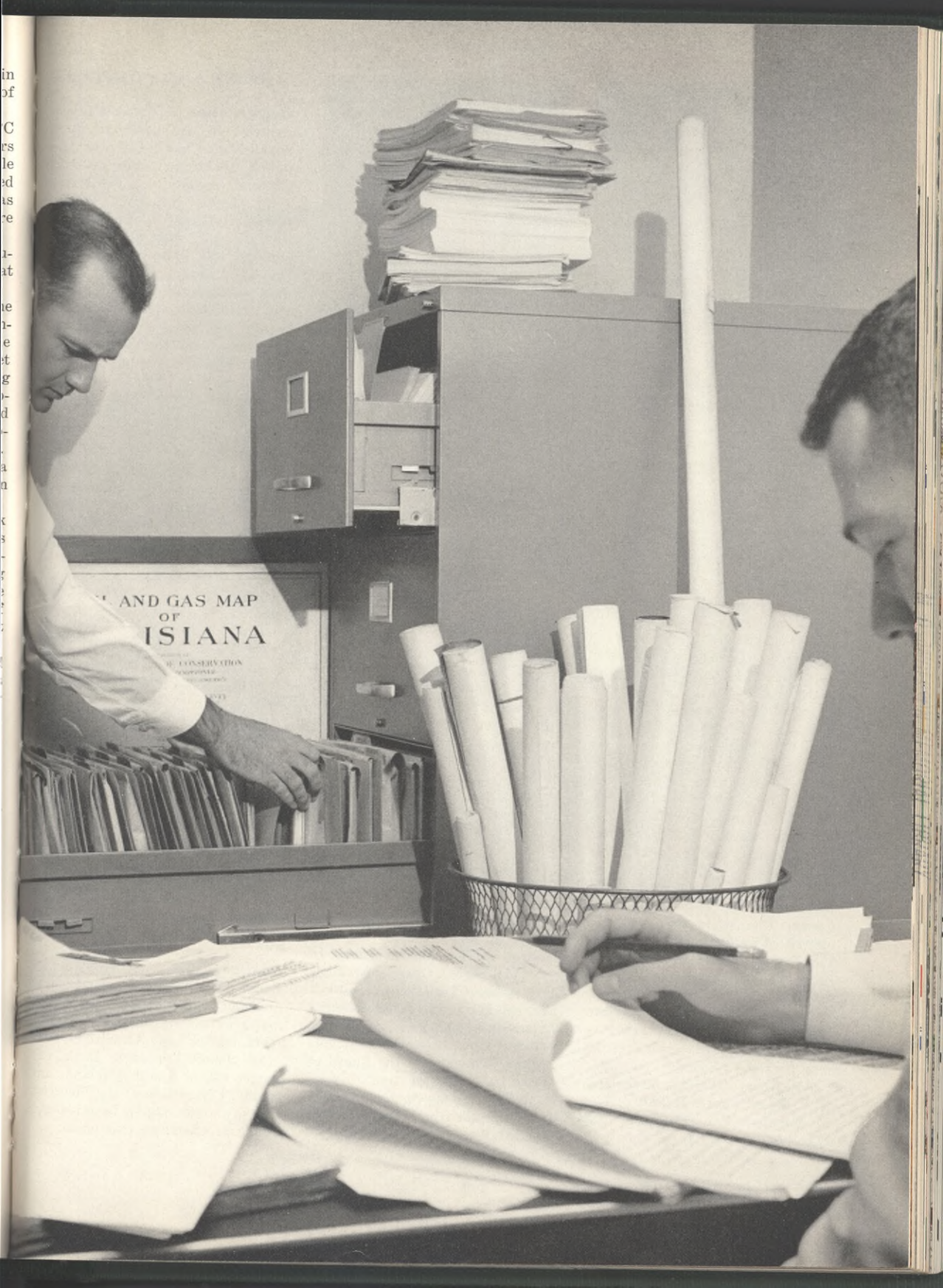
The New Orleans office handles the clerical work needed to direct operations of a large natural gas plant at Erath, Louisiana. Erath is a unitized operation, with Texaco and three other companies owning almost 99 per cent of the interests. However, some 70 private citizens around Erath own tiny parcels of leased lands—their total holdings represent 1.5 per cent of Erath ownership.

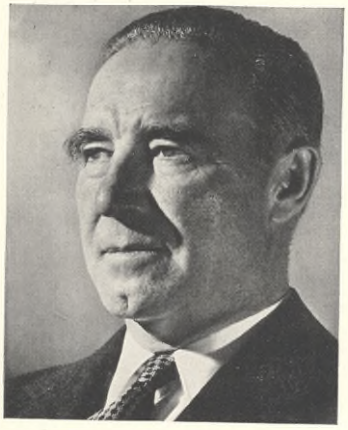
Under FPC regulations, the Company is compelled to represent each of these 70 small owners, which means that for every transaction with the FPC involving Erath the New Orleans office's paperwork multiplies by 70.

Legislation freeing producers from the present impractical FPC regulation seems only right to the people who run enormous risks to find gas (it costs on the average about $150,000 to drill a 10,000-foot wildcat well, although some deep wells cost considerably more than $1 million; and only one new-field wildcat in every nine finds oil or gas).

If such legislation is not enacted, the outlook for the country's consumers is grim indeed. In President Eisenhower's own recent words to Congress: "Legislation freeing gas producers from public utility-type regulation is essential if the incentives to find and develop new supplies of gas are to be preserved. . ." •

Paperwork mounts in dizzying piles; some paperwork has increased 70 times in the Company's New Orleans office.


AND GAS MAP
OF
ISIANA



O. J. DORWIN

New Director

During his more than a quarter of a century with Texaco, Oscar John Dorwin has served in the Legal Department of the Company. Petroleum law, because of its international scope, is even more complex than most. Mr. Dorwin has had wide experience as an officer concerned with Company operations in the U. S. as well as other nations.

On January 25, 1957, John Dorwin was elected a Company Director by the Board—an appointment that became effective February 1. A 1917 graduate of Notre Dame (Ph.B.), he received his LL.B. degree at Harvard Law School in 1920. He became associated with the Company in 1931 when Texaco acquired the Indian Refining Company, of which he was general counsel. He was made The Texas Company's General Counsel in 1944, and was elected a Vice President in 1951. As Vice President and General Counsel, he is today in charge of all legal matters concerning the Company. He is a member of the American Petroleum Industries Committee, and has served as that group's chairman for three years.

As a Texaco Director he replaces R. F. Baker, former Executive Vice President, whose retirement was effective February 1.

T. A. MANGELSDORF

New Vice President

Ever since his college days, Theodore A. Mangelsdorf has been closely associated with petroleum refining. His election by the Board on January 25, 1957, as Vice President (effective February 1) highlighted 35 years of studying, instructing, and applying petroleum science. He first became interested in the oil industry as a chemical engineering student at Massachusetts Institute of Technology. After receiving his Master's degree in 1929, he was appointed to the M.I.T. faculty; he was assistant professor of fuel engineering when he joined Texaco in 1933.

His early work with the Company was at Port Arthur Works, where for several years he was in charge of pilot unit investigations on cracking. In 1947, he became Superintendent of the Lockport refinery; in 1950, General Superintendent at Port Arthur Works; in 1953, Manager, Operations Division, Refining Department; in 1954, General Manager of the Refining Department. As a Vice President he will carry out special assignments for the Chairman of the Board of Directors. W. G. Copeland, formerly Manager of the Operations Division, succeeds Mr. Mangelsdorf as General Manager of Refining.

★ BRIEF AND POINTED ★

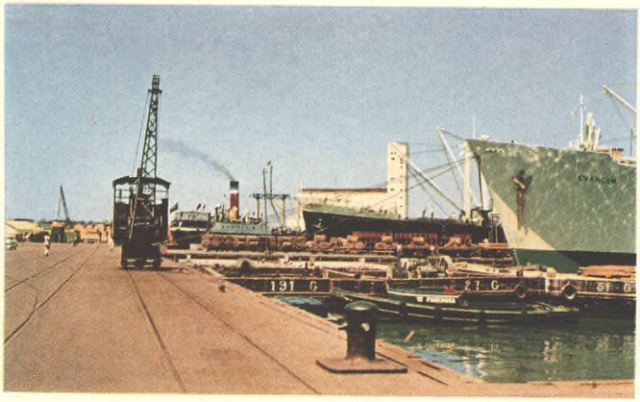
Construction of Texaco's newest refinery, to be known as Puget Sound Works, has begun near Anacortes, Washington. With crude oil charging capacity of 40,000 barrels a day, the new refinery will manufacture automotive gasolines; jet fuel; Diesel, furnace, and heavy fuel oils; and liquid petroleum gas for the rapidly expanding markets in the Northwest and West Coast areas. It will be built on a site of approximately 760 acres on the Olympic Peninsula, about three miles east of Anacortes, and is scheduled for completion early in 1959. Puget Sound Works will bring Texaco's total number of refineries in the United States to 12, exclusive of two asphalt plants. J. T. Froehlich, formerly Superintendent-Special Assignments in the Refining Department, has been named Superintendent of the new refinery.

Texaco's expanded interests *in Canada were reflected in the official listing of stock of The Texas Company on the Toronto and Montreal Stock Exchanges commencing February 1, 1957. Texaco has an interest of approximately 65 per cent in the common shares of McColl-Frontenac Oil Company Limited, manufacturer and marketer of Texaco products in Canada. The Company's wholly owned subsidiary, Texaco Exploration Company, is carrying out extensive exploration and producing activities in Western Canada. Texaco has substantially increased its Canadian interests through acquisition of The Trinidad Oil Company Limited, which held a 90 per cent interest in Regent Refining (Canada) Limited. Regent is now a subsidiary of McColl-Frontenac.*

Facilities have been completed at Port Arthur Works for producing di-isobutylene, which is used in the manufacture of plastics, elastomers, lubricating oil additives, and other chemical products. Initial capacity will be 8 million pounds annually. Completion of the facilities marks another step in Texaco's current petrochemicals expansion.

At her primitive loom not far from Cuzco, the ancient capital of the Incas, a Peruvian Indian woman weaves—as yet unaffected by the changing fabric of existence in her own and neighboring countries. In Peru, hopeful oil explorers are searching for a treasure surpassing her Incan ancestors' gold. Discovery and development of Latin America's petroleum resources are creating a new era; although change has yet to reach this weaver and her family, it is approaching.

Growing through Friendship



From the inner harbor of Callao *(above)*—the modern port of Lima—ocean freighters carry valuable cargo from Peru to the markets of many nations. Foreign trade is currently at record levels, and the flow of exports and imports is unparalleled in Peru's history. Gold, silver, copper, iron ore, and other minerals from the great mines of the Andes are shipped from Callao and other ports on the Pacific. Cotton, sugar, and petroleum are also exchanged for products from abroad. Peru's economy is expanding in an atmosphere that is friendly to private foreign investment. Here, as elsewhere in Latin America, Texaco welcomes the opportunity to participate in a good neighbor's progress.