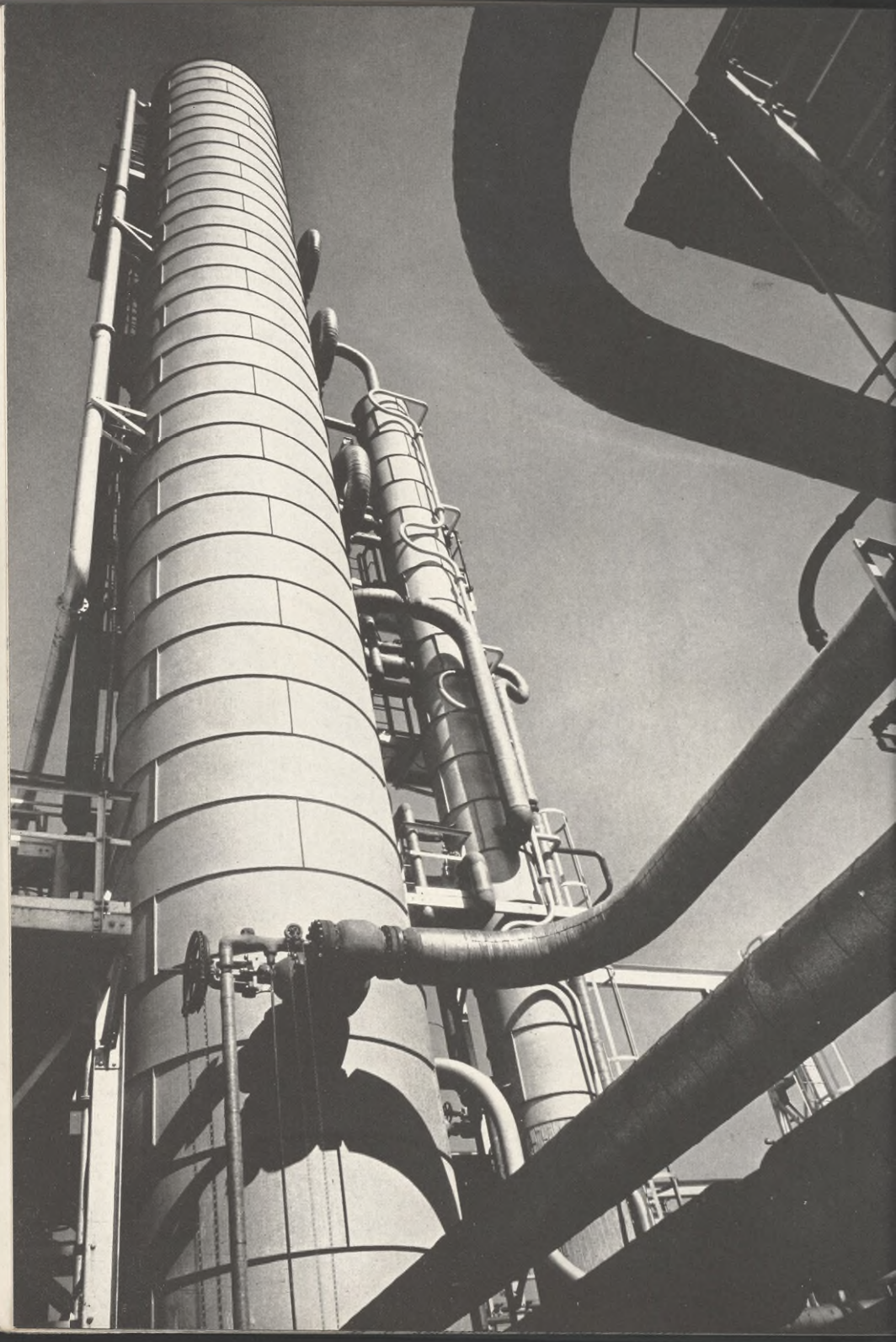
THE TEXACO STAR *Petroleum Industry Number*



THE TEXACO STAR

Petroleum Industry Number

VOLUME XXVI NUMBER 2

Our front cover illustration shows a portion of a rotary drilling rig, with a rock bit at the end of the drill collar ready to be lowered into the hole. It was photographed in color at the New York World's Fair, where the rig is in operation, by Robert Yarnall Richie. The inside front cover picture, showing a refinery fractionating tower, is also by Mr. Richie. Inside back cover illustration courtesy of Transcontinental & Western Air, Inc.

A PUBLICATION OF THE TEXAS COMPANY

For distribution to employes and stockholders. To others interested, the subscription price is one dollar per year

DIRECT ALL COMMUNICATIONS TO THE EDITOR OF THE TEXACO STAR
135 EAST 42ND STREET, NEW YORK CITY

★ August 27 was the petroleum industry's eightieth birthday—the anniversary of the day on which, in 1859, Colonel Edwin L. Drake proved that man could drill for oil and produce it in commercial quantities.

★ Drake found oil at a depth of 69 and one-half feet. Oil is now produced at depths of 10,000 to 13,000 feet.

Brief AND TO THE POINT

★ Petroleum occurs and is usually found with natural gas under the surface of the earth. It is a mineral. Many students of the subject now agree that remains of plant and animal life—organic materials—buried with rocks under thousands of tons pressure are the source of petroleum and natural gas. This is known as the organic theory.

★ Oil is found in rocks laid down in the making of the earth's crust even farther back than the Cambrian period, which dates back 1,080,000,000 years before the dawn of primitive man.

★ The first recorded production of crude oil in the Southwest amounted to 48 barrels per year from two wells near San Antonio, Texas. That was 50 years ago—30 years after the industry began. Today it takes nearly 48 barrels of crude to supply the annual petroleum needs of the average American family.

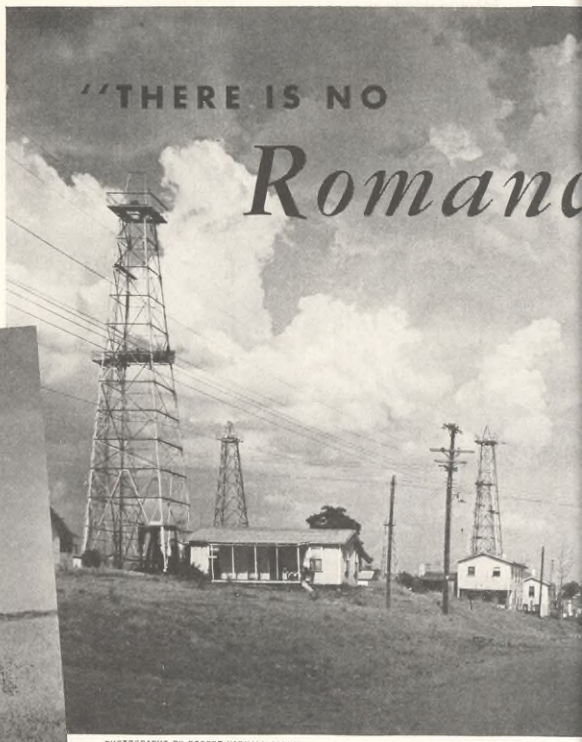
★ From a newspaper account published about 40 years ago: "Mr. and Mrs. John D. Davis have reached Chicago with their ill-fated motor carriage. Little of the original motor and running gear mechanism with which the couple started from New York, under the auspices of the *New York Herald*, was left—the principal remainder, it was said, being the rear axle, and that broke at the crossing of 71st Street and Bond Avenue in Chicago. When a new axle shall have been fitted, it is the intention to proceed to San Francisco."

★ New discoveries of modern science are helping "spent" wells produce second "crops" of petroleum.

★

(Below) Modern oil hunters, equipped with seismographs, torsion balances, dynamite and radio telephones are a far cry from the men who located oil fields by means of the divining rod

COURTESY HERCULES POWDER CO.



PHOTOGRAPHS BY ROBERT YARNALL RICHIE

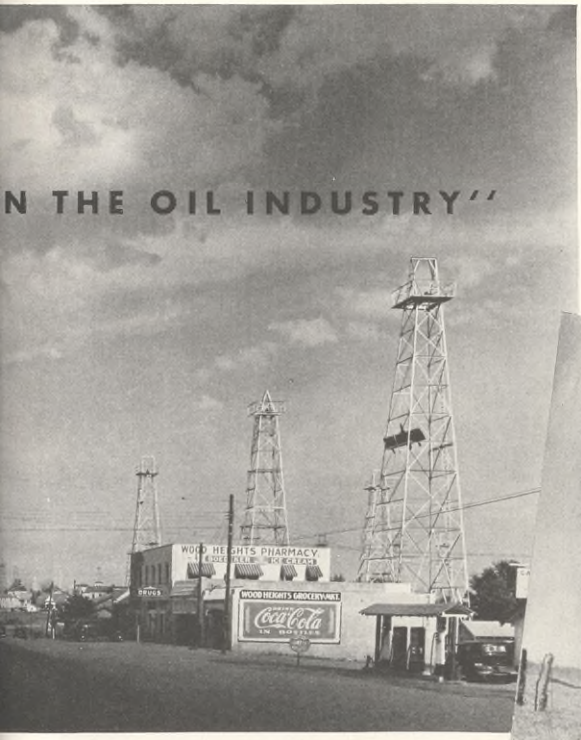
"ROMANCE in the oil industry?" The geologist leaned back in his chair and surveyed his visitor with a scowl. "Nonsense! What's romantic about drilling holes into the ground to produce a few thousand barrels of an unpleasant-looking, evil-smelling liquid, most of which will wind up as gasoline to carry Uncle Willie out to the golf course of a Sunday afternoon?

"I'll grant you that in the old days there was color and life to the producing branch of the business at least. For a good many years after Colonel Drake drilled America's first oil well out in Titusville, Pennsylvania—that was in 1859—oil had the glamor that characterizes any pioneer enterprise. Those old boys had no idea of the magnitude of the business they were building. They drilled their wells 'by guess and by golly,' and they never knew until the last minute whether they'd find a gusher and a life income or just another 'dry hole.'

"There was an element of romance in doing business that way, but science has practically done away with all that. Nowadays we usually know just about where to drill a well, and after a few tests have been drilled we can generally estimate how much oil the field will produce. Of course, as in any business, there is still an element of chance, but don't talk to me about 'romance.'"

"Well," observed the visitor, "suppose you tell me how prosaic the oil business is then."

"Take an organization like The Texas Corporation," continued the geologist, ignoring the interruption. "Our producing organization is active in 18 states in this country as well as in a number of South American countries. What happens nowadays when an organization like ours wants to drill a well?



★

(Below) Charting the speed of sound waves set up by small charges of dynamite, the geophysicist can locate sub-surface structures which are favorable to the accumulation of oil

COURTESY SEISMOGRAPH SERVICE CORP.

First of all, we send out a party of geologists. Those fellows haven't a speck of the color and life that the old divining-rod boys used to have. You know, in the industry's younger days, oil men used to swear by the divining rod as a locater of wells. But today's geologists and geophysicists are equipped with seismographs, torsion balances, dynamite and radio telephones. Unlike the tobacco-chewing rum guzzlers you've read about in fiction and seen in the movies, these men look like mathematics professors—and what they can do with a table of logarithms would make the average math prof run for cover.

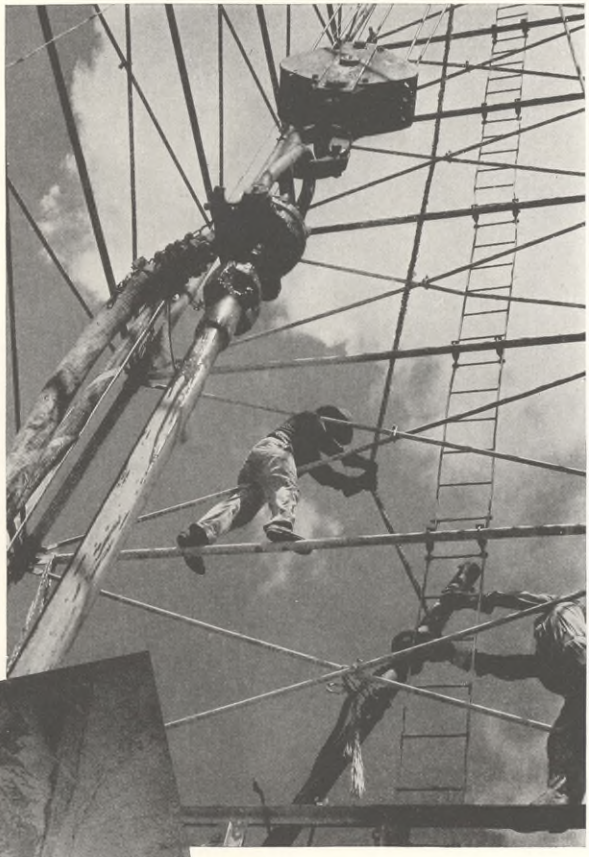
"Well, once it is decided to make a survey, the geophysical crew moves in. One gang plants small charges of dynamite in the ground at various points. Of course they've surveyed the 'surface indications' of the ground first with the aid of aerial maps. Another gang about a mile from the first party sets up recording instruments and begins to chart the vibrations of these miniature 'earthquakes' as the dynamite charges are set off. You see, sound waves travel at different speeds through different types of earth and rock formations. By correlating these findings your modern oil man can tell after a few days of surveying what type of sub-surface structure exists in that particular locality, and whether that structure is favorable to the accumulation of oil.

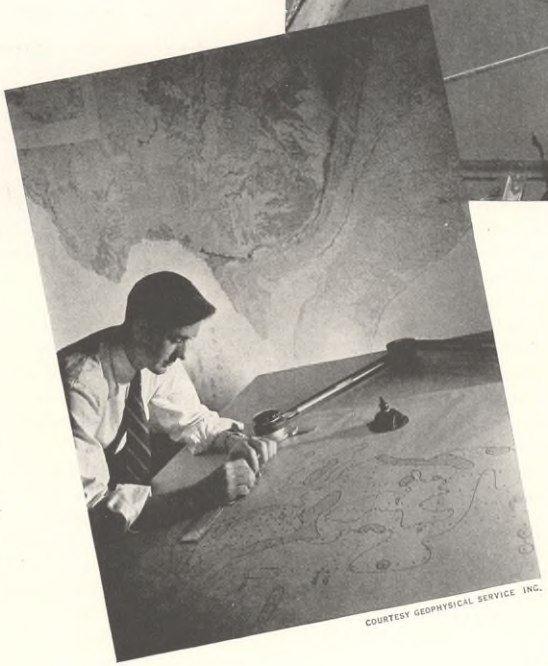
"Now suppose the findings indicate the presence of a 'fault' or a salt dome, or some other structure where oil accumulates. The oil itself is still several thousand feet below the surface of the ground. So there is nothing to do except drill for it.

"There are two methods used in drilling oil wells. The older system, known as the 'cable tool' or 'standard' method, consists of alternately lifting and dropping a set of tools into the hole, the weight of

★

If the geologists' findings indicate the presence of a "fault" or other structure where oil may be present, a location is recommended, a derrick erected, and field boilers, tanks, and all other paraphernalia of a modern drilling rig are installed. At the right is shown a portion of a so-called rotary drilling rig while below we see a draftsman preparing a map of an oil field





COURTESY GEOPHYSICAL SERVICE INC.

the tools forcing the hole downward. This method is still used in drilling shallow wells or through soft formations. The second and, at the present time, more popular method, is rotary drilling, where you make your hole by rotating a sharp drilling bit at the end of a string of pipe.

"After mutually satisfactory lease agreements have been entered into with the owner of the land and the geological division has recommended a location, a derrick is erected and field boilers, tanks, and all the other paraphernalia of a modern drill-

★

(Right) Once a well has been brought in and gas pressure drops so that it ceases flowing, it is usually "put on the pump." Photo shows a modern pumping unit. (Below) Closeup of a modern rotary drilling table—workers handle gigantic tools and long, heavy pieces of pipe with remarkable ease

COURTESY REED ROLLER BIT CO.

TESY CLIMAX MOLYBDENUM CO.

ing rig are installed. Then the drilling crew moves in and the hole is 'spudded in.' The drilling bit twists its way down through earth and rock to the oil sand. After that, barring an occasional mishap, such as the tools twisting off, the sticking in the hole, cave-ins, or a sudden blow-out of gas or oil, there's your well. What's romantic about it?

"Of course, oil wells today are drilled practically anywhere—mountains, desert plains, in the middle of city lots, or out in the ocean itself. Take The Texas Company again. We have wells that cling to the sides of steep California mountain passes. Out in West Texas, where the ground is so flat you can see a jack rabbit half a mile away, you'll find Texaco wells. And in Southern Louisiana, miles from dry land, Texaco wells are reaching down under the muddy bottom of the Gulf of Mexico and drawing up crude oil. The men on these locations are nearly 50 miles from dry land for weeks at a time. They live in camps built on piling and ride to work in motor boats and sea planes. Every piece of equip-

ment must be transported by water, and the oil itself is stored in barges and on ships that have outlived their usefulness as ocean-going vessels but are still suitable for use as tanks.

"One of these ships is an old Shipping Board veteran. Another was originally a French sailing vessel. She was called the *France Marie,* and she still has some of her original fittings—an elaborately carved wooden helm and beautifully paneled officers' quarters. But there's no romance in her now—just an old hulk anchored to the bottom of the Gulf and filled with greasy black crude.

"Why this Texaco organization has reduced the business of oil production to such a science that there's no real kick to it any more. To jump a long distance from Louisiana—Texaco has extensive crude reserves 'way up in the Moffat and Tow Creek fields in Northern Colorado, up in Wyoming, and on the western slope of the Continental Divide. We also have a big reserve of oil shale lands in Utah and Colorado. Our organization has made sure of its crude oil reserves for a good many years to come.

"Even down in South America, in Venezuela and Colombia, subsidiaries and affiliates of The Texas Corporation have a number of concessions and fee holdings. There's a ranch in Colombia that is used for a headquarters, and to show you how unromantic these oil men are, the ranch house is built almost entirely of solid mahogany. You see, mahogany is abundant and cheap down there—but still I'll admit that is a pretty unusual looking ranch house.

"As for 'colorful oil field characters,' the personnel of The Texas Company's Producing Department isn't any more colorful than any average group of men. Of course producing men employ unusual expressions. A 'rope choker,' for instance, is a man who uses the cable tool method of drilling. A 'swivel neck' is a fellow who drills by the rotary method. A helper in the oil fields is called a 'roustabout,' and his boss is a 'gang pusher.' A geologist to these men is a 'rock hound.' But such queer sounding parts of a drilling rig as the 'kelly' or the 'headache post' you

In Southern Louisiana, miles from dry land, Texaco wells are reaching down under the muddy bottom of the Gulf of Mexico and drawing up crude oil. The photograph shows a flowing well in this locality, at right, with its "Christmas tree" arrangement of valves to control the flow, and in the distance a well being drilled with one of the Texaco portable drilling barges

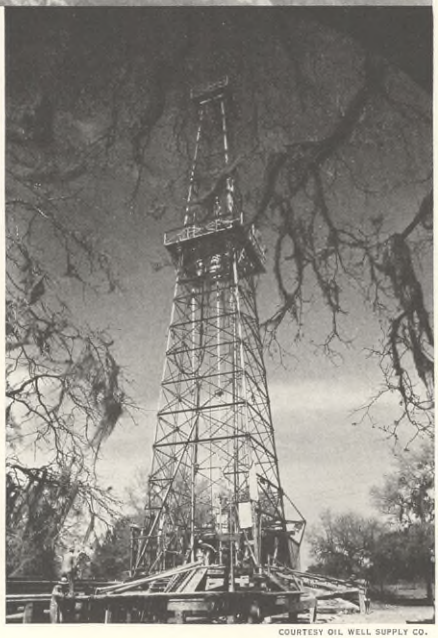
Oil wells today are drilled practically anywhere—mountains, desert plains, or in the middle of city lots. Above is shown a portion of the Moffat Oil field in Northern Colorado, where The Texas Company has extensive crude oil reserves. The photograph at the right shows a well being drilled in the picturesque Evangeline country of Southern Louisiana

★

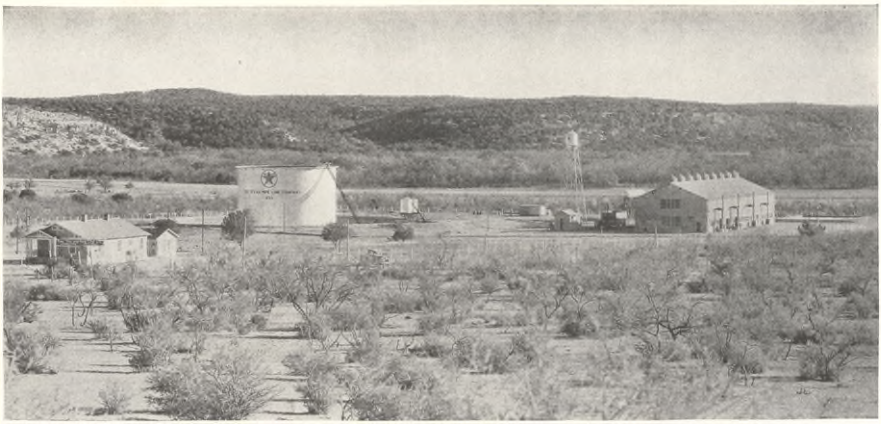
will find are nothing but pieces of pipe or ordinary beams.

"Really, we're just a bunch of average, normal human beings, doing our jobs as best we know how, no matter where we are called upon to work. No sir, there just isn't any romance to the oil business. It's a workaday job, just as unromantic as making automobiles, or flatirons, or dill pickles."

★ ★



COURTESY OIL WELL SUPPLY CO.



Junction, Texas, pumping station on The Texas Pipe Line Company's West Texas twelve-inch line

OIL PIPE LINES—

THE PETROLEUM INDUSTRY'S LOGGING ROAD

A FOOD manufacturer once boasted that his product was "untouched by human hands." Petroleum, from well to market, is not only untouched by human hands, but virtually unseen by human eyes from the time it leaves the earth until the service station man holds up the oil stick and says, "It'll take about a quart."

One phase of this invisibility is the petroleum industry's pipe line system. Shortly after the completion of the first oil well in this country just 80 years ago, the need for pipe lines to supplement existing forms of transportation was recognized. The first interstate line was built in 1879, and at the end of that year there were 697 miles of pipe line in operation.

This unique system, itself invisible except for occasional surface equipment such as pumping stations and tanks, is little known to the general public. Enormous tonnages of oil are moved so quietly under the ground that few people are aware of the magnitude and importance of this mode of transportation.

Last year the petroleum industry operated 96,500 miles of interstate pipe lines, representing an investment of more than 800 million dollars. In addition, there were about 20,000 miles of intrastate lines, an investment of about 100 million dollars more.

A pipe line system consists of gathering lines, which transport the oil from the wells to points of delivery within the gathering district, and the main or trunk line. The gathering system extends to all parts of the oil field, with branches or "feeder" lines to the leases of all producers in the field. The trunk line is the main artery through which the crude oil moves to its ultimate destination, the refinery.

Crude oil wouldn't move through a pipe line very far or very fast by gravity alone. Hence pumping stations must be built along the pipe line. These are usually about 40 miles apart. Each pumping station is equipped with engines and pumps powerful enough to "shove" the oil through the line to the next station.

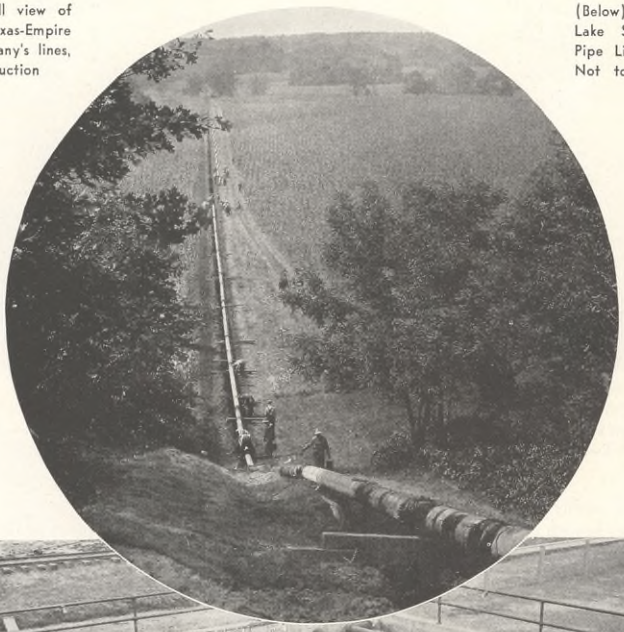
For the producer of petroleum, the pipe line provides a double function. It furnishes transportation for his product at low cost, and it brings the market for his crude to the very mouth of his well, assuring him an automatic outlet for his oil up to the limits of demand. Although pipe lines have become common carriers by legislation, they nevertheless fulfill a definite plant requirement, that of assuring an adequate supply of crude oil to the one or more refineries they serve. Their continuous operation, an

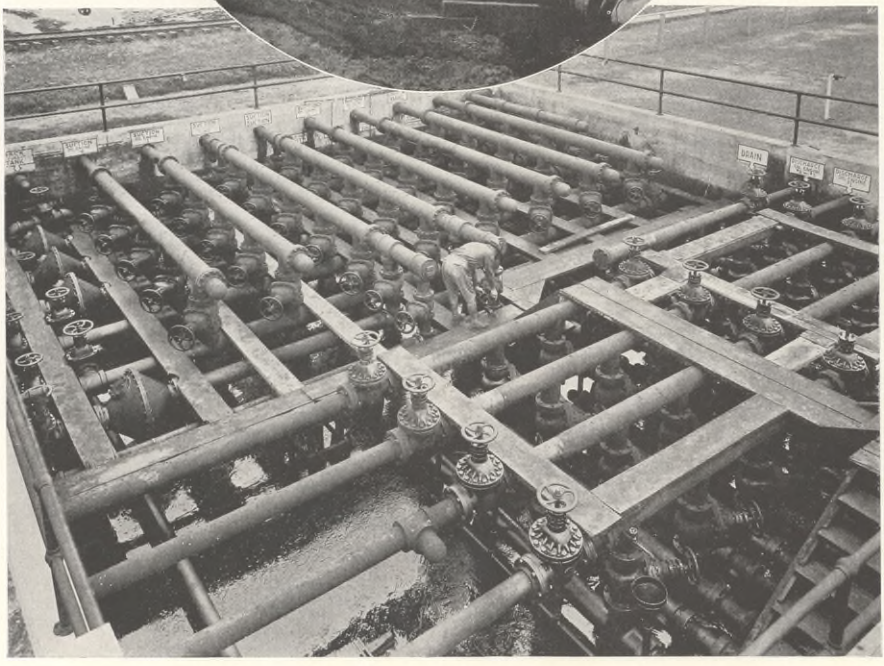
economic as well as mechanical requirement, depends upon coördinating their operations with those of the refineries with which they are allied or integrated.

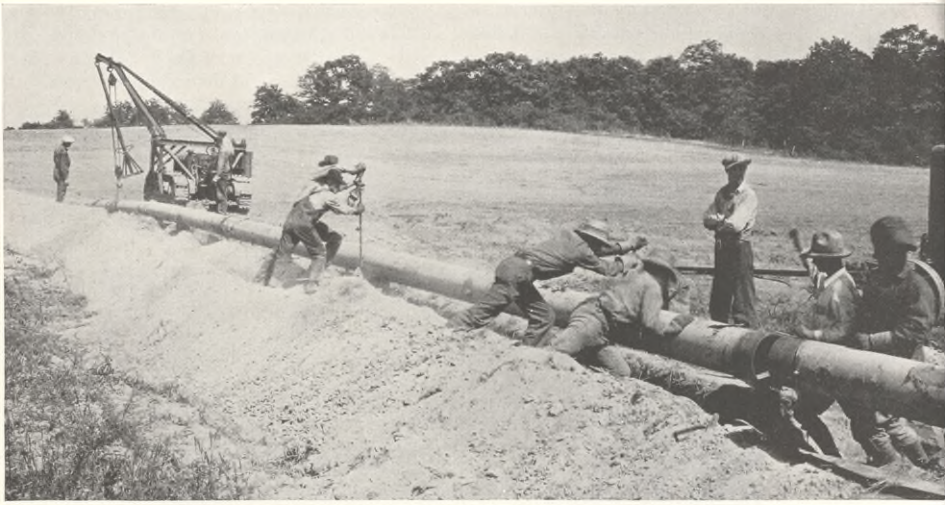
It is commonly believed that pipe line construction and operation are simple and involve no highly technical engineering problems. On the contrary, pipe line operation is one of the most highly technical

(Right) Down-hill view of one of The Texas-Empire Pipe Line Company's lines, under construction

(Below) Manifold at Sour Lake Station, The Texas Pipe Line Co. Confusing? Not to a pipe-line man







Lining up sections of pipe on The Texas-Empire Pipe Line Company's Cushing, Lockport twelve-inch line

branches of the oil business. It involves the application of nearly every branch of engineering employed in the industry. In designing and constructing a pipe line system, some of the problems to be met are the size, weight and type of pipe to conform to the working pressures and hydraulics of the system, the design and spacing of pump stations, and the design or selection of station equipment. Other factors are the length of the line, its relative elevation, and the characteristics of the crude to be transported.

Two characteristics of crude oil which affect its transportation are its specific gravity, which is an index to its weight, and its viscosity, which is a measure of its internal friction. For example, the viscosity of molasses is high, while that of water is comparatively low. Moreover, viscosity is fixed only at a given temperature, and as the temperature of the oil changes, so does its viscosity. Crudes produced from different fields, and often from the same field, are unlike in chemical composition. Each kind of crude, therefore, presents an individual problem in pipe line transportation.

In developing pipe line transportation in the industry, it is the refiner who has supplied the initiative and the capital. His purpose has been to secure for his plant an adequate supply of raw material—crude oil—to meet his requirements. He has done this to reduce the risks of his enterprise. A refinery represents a huge capital outlay; in a plant of any importance millions of dollars are involved. Not only must he have a good supply of raw material, but he must reach his markets conveniently and economically. Therefore, he must locate his plant within economical transportation range of large consuming centers.

To reconcile these two requirements, the refiner needs a pipe line. Ordinarily he must build this line himself, since no independent agency would consider it good business to provide transportation between an uncertain, depletable source of supply at one end, and a single customer at the other. Moreover, if it were economical to transport crude oil to some central point and there sell it for reshipment to refineries, such a procedure would have developed naturally in the industry.

Considered broadly, there are a few points in common between pipe lines and railroads, but the two are by no means truly analogous. Oil pipe lines were built for one particular purpose in one particular industry—to transport one commodity only, in one direction. In other words, the pipe line is primarily a plant facility peculiar to its own industry, like power transmission lines in the electric power industry, the logging road in the lumber industry, and the aerial tramway and belt conveyor in the mining industry.

Railroads, on the other hand, are built to make a profit from transportation. They carry everything not prohibited by law in whatever direction required. In so doing, they usually have return hauls of other products. They serve the public at large and depend

upon the public as a whole for all their business.

Every barrel of crude taken out of a field means a barrel less for the future. By its very nature there is in pipe line transportation an inherent hazard, an element of uncertainty and temporary service that has little if any place in railroading.

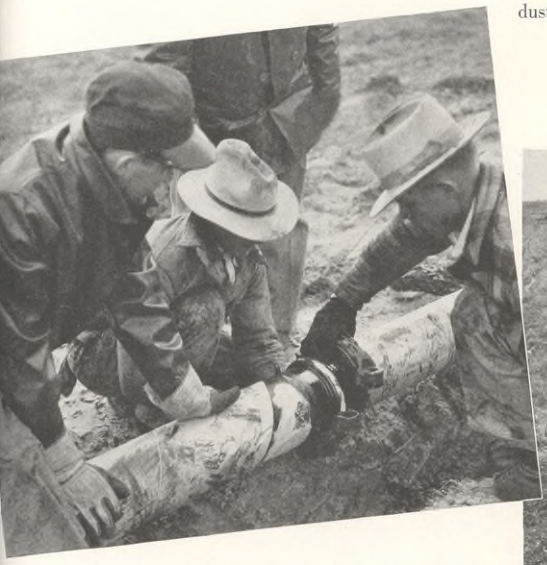
Because of the volume of crude oil and its products (present daily average crude oil production is 3,500,000 barrels), it would be physically impossible for the railroads to supplant pipe line transportation, notwithstanding that the railroads' revenue from petroleum and its products is one of their greatest sources of income.

If nothing but independent pipe lines were available, the small refiner would be the principal sufferer. Separating these lines from their present owners, thus depriving them of their assured tonnages and outlets, would necessarily result in increased transportation costs. Under such conditions, the sole interest of the independent pipe line would be transportation for profit. The new owners would have neither the oil production nor the refinery facilities to make use of the lines. They would be limited to transporting such oil as they might be offered, from a shifting source of supply, in an industry subject to the most violent fluctuations of supply and demand. For self-preservation they would be forced to impose tariff rates high enough to insure them against the uncertainties of their position. The integrated oil companies with their own pipe line plant facilities are the most efficient and economical operating units of the petroleum industry.

As of December 31, 1937, there were 58 pipe line carriers under the jurisdiction of the Interstate Commerce Commission. Separation of the pipe lines from the integrated companies would affect 51 of these companies, representing more than 82,000 miles of line, 22,280 employes, and an investment of $758,465,700. This represents 86 per cent of the total pipe line mileage, 92 per cent of the total employes, and 94 per cent of the investment in carriers' property.

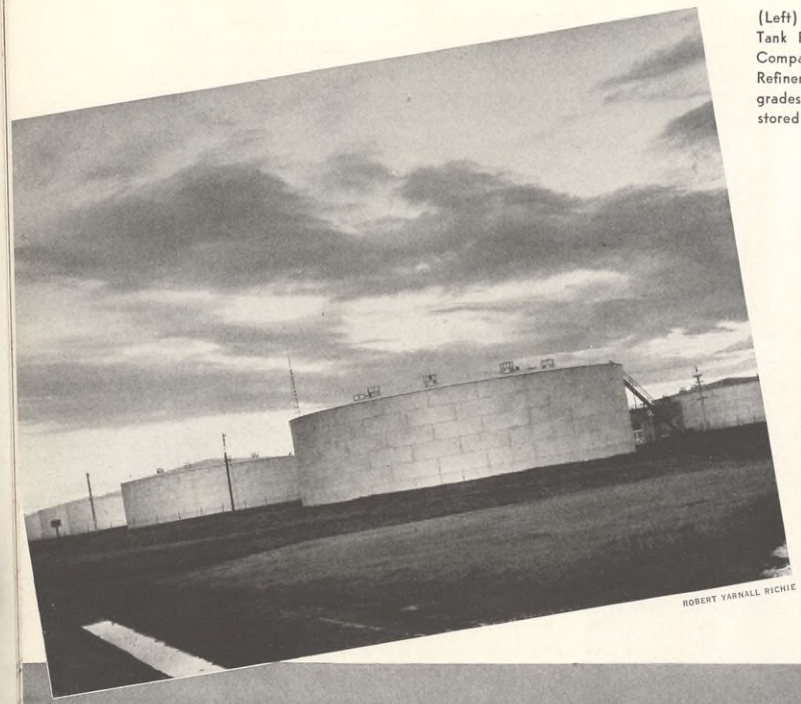
Any action that would so drastically affect an industry warrants serious consideration.

★



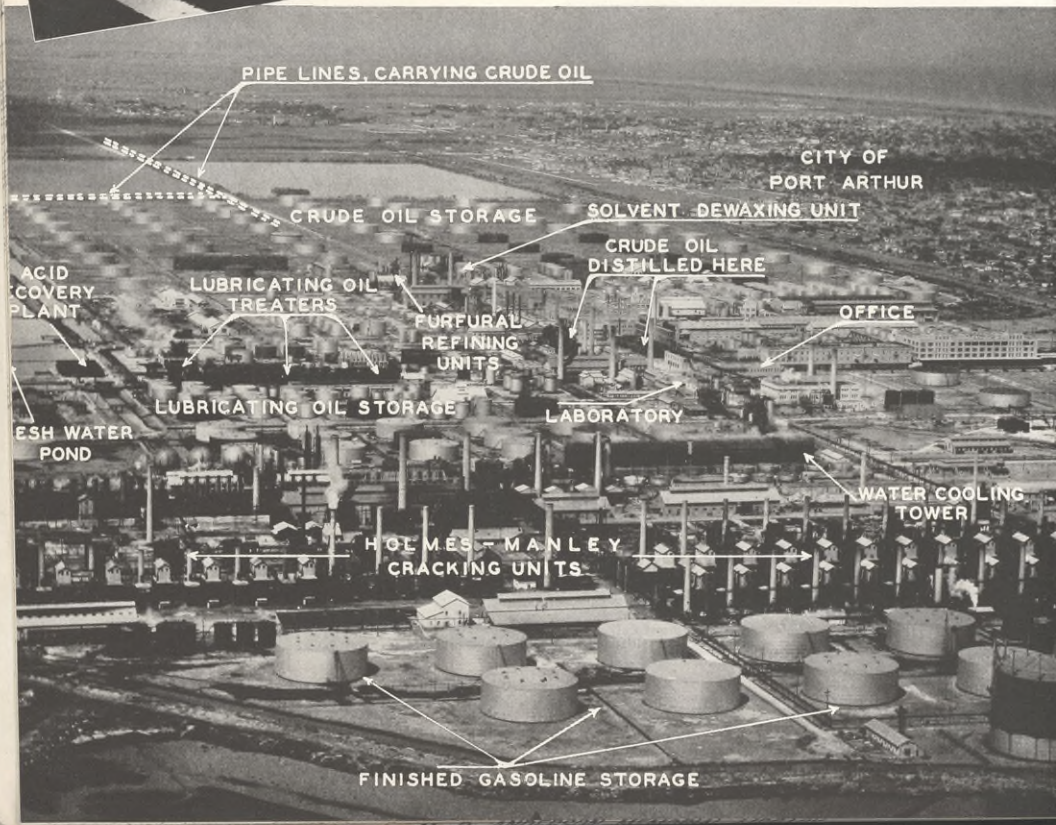
(Above) Two ends of pipe ready to be fitted with a vitaulic-type coupling: Care is taken to make the joint absolutely oil-tight

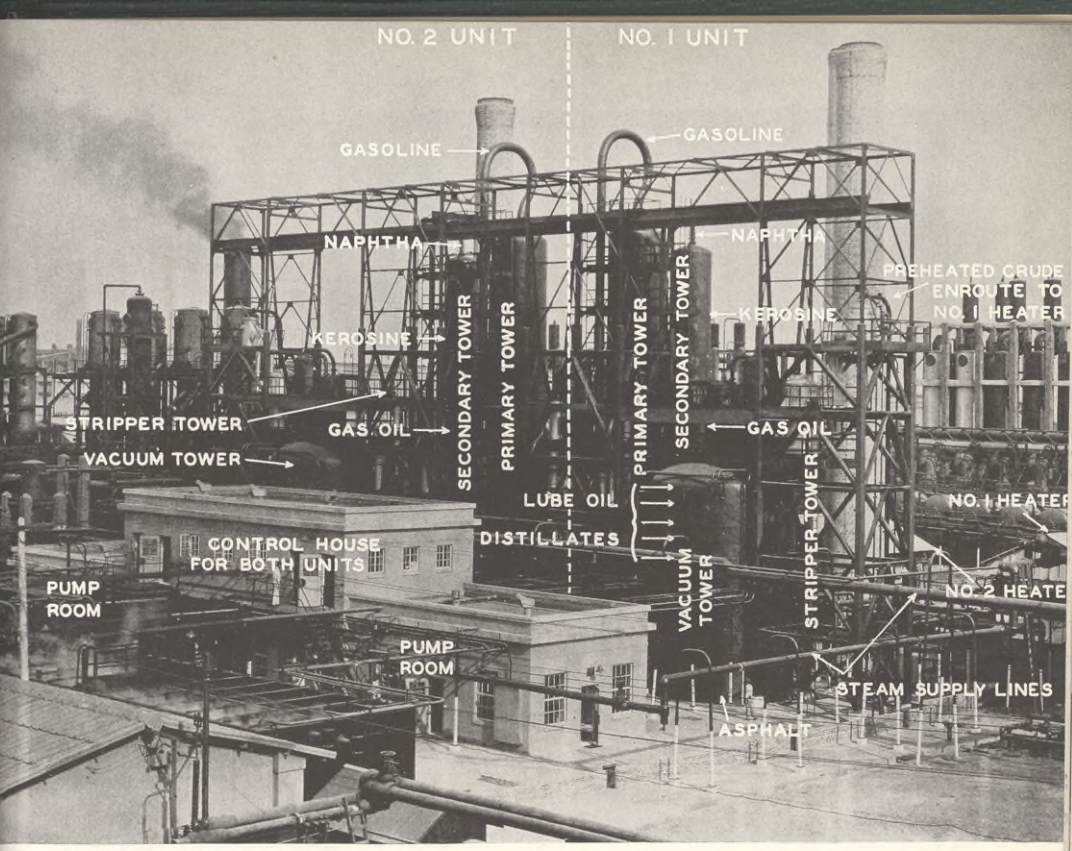
(Right) On some lines the ends of pipe are joined by welding. When this welder finishes his work, the pipe line will be lowered into the ditch which has been dug for it



(Left) Part of the North Tank Farm at The Texas Company's Port Arthur Refinery. Here the various grades of crude oil are stored before manufacture

(Below) Photo diagram of the Port Arthur Refinery, largest of 19 operated by Texaco. Here crude oil is boiled, condensed, washed, filtered, blended and its molecules smashed and reformed to yield gasoline, kerosine, lubricating oil, asphalt, wax, grease and hundreds of other products





(Above) Photo diagram of Badger stills, for refining crude oil: Note the various towers and the pipe lines carrying the several "cuts" or fractions of the crude oil. This is but the first step in refining of petroleum

IF YOU WANT TO MAKE SOMETHING OF IT—

Crude oil must go through many processes to yield useful products

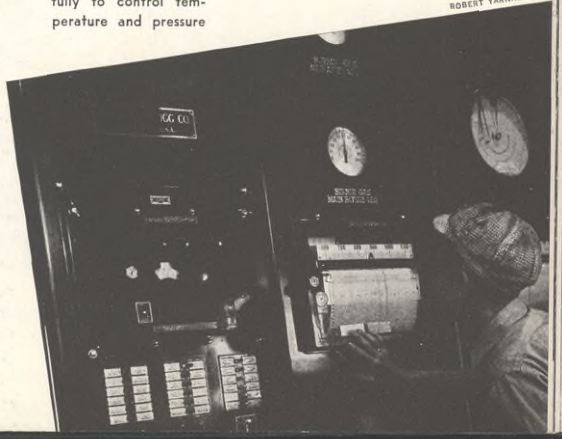
THE OIL industry's principal job is to convert a raw material—crude petroleum—into useful products. Secondly, it must make those products so low in price that everyone will buy them.

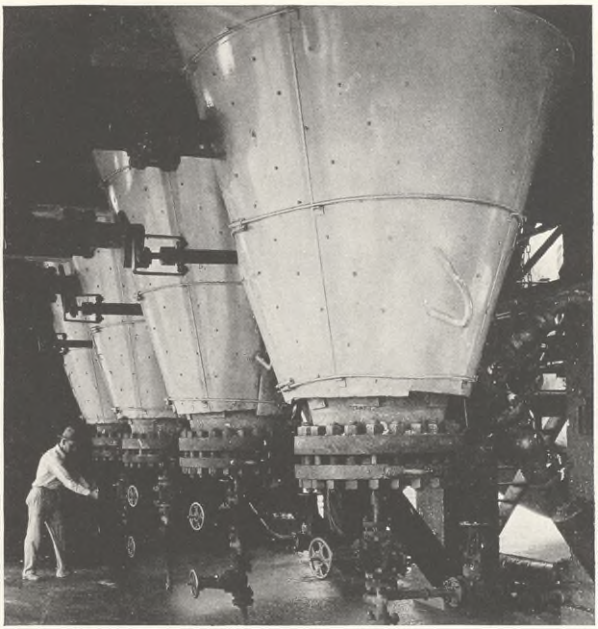
When you think of oil, you don't generally think of it as a manufactured product. Yet the gasoline that drives your motor car and the oil that keeps the moving parts lubricated, the carbon black that was used in the rubber of your tires, and the asphalt road you ride on—all came from a single source product—crude oil.

Millions of dollars each year are spent in research

(Below) Control panel in a modern refinery: Many charts and dials must be watched carefully to control temperature and pressure

ROBERT YARNALL RICH





★

Lower portion of four cracking units in a battery, showing the lines through which the heavy residuals of the process may be drawn off. The rest of the original charging stock has been converted into cracked gasoline

★

to make petroleum products more valuable to the consumer and still cheaper in price. The value of such research is apparent in the fact that today more than 300,000 organic compounds can be made from petroleum. Crude oil, therefore, is a source product that rivals coal tar in the quality and quantity of possible derivatives.

In the modern petroleum refinery crude oil, by the thousands of barrels, is boiled, condensed, washed, filtered, blended, its molecules smashed and reformed, to yield gasoline, kerosine, lubricating oil, asphalt, wax, grease, and hundreds of other products. The first step in the refining process is distillation, to separate the crude oil into various cuts or "fractions." Advantage is taken of the fact that these fractions of crude oil have different boiling points. Thus, in simple distillation, crude oil is placed in a vessel commonly known as a still. There, by the application of heat, boiling occurs and the resultant vapors are condensed or liquefied by cooling with water. The first vapors given off will be found to consist principally of gasoline. On continued heating, with an increase in temperature, the vapors will consist largely of the kerosine "fraction." Next the gas oil and finally the lubricating oil fractions will be vaporized, leaving a liquid residue in the still which may be very heavy lubricating oil, asphalt, or industrial fuel oil. In some cases, distillation may be carried still farther, decomposing the liquid residue and leaving as a final product a hard petroleum coke.

In the early days of the industry, petroleum refining similar to that described was actually used. Present-day requirements, however, are such that much more highly developed and complicated methods and equipment are needed. Thus, in the modern "pipe still," crude oil is continuously pumped through tubes located in a furnace. Here it is heated to a temperature sufficiently high to vaporize completely the products desired as distillates. The partially vaporized crude is then discharged into a "fractionating tower," from the bottom of which the unvaporized residue may be drawn off as a liquid. The vaporized portion rises in the tower, into which cooling is introduced by "refluxing," or pumping back some of the condensed liquid products. By means of this regulated cooling, partial condensation occurs within the tower, and by proper control it is possible to condense selectively and withdraw from the tower at various points the products desired, uncontaminated with other products. Modern distillation processes are continuous operations, carried out on a gigantic scale. The average pipe still will charge continuously 420,000 gallons of crude oil per day.

Since gasoline is the product desired from crude in the largest quantity, the refiner must conduct his operations to secure the highest possible yield of this product. But if the gasoline supply were limited to what is present in the crude oil as such, present-day demands could not possibly be met. Therefore, the refiner must convert into gasoline other products, for which there is little or no demand. For example, a large percentage of the crude is gas oil, which is too heavy for kerosine, yet does not have the proper characteristics of lubricating oils.

The conversion of this otherwise waste product into gasoline is accomplished by the cracking process. In ordinary distillation, the separation of the crude into various products involves only a physical change. In other words, the various products, after separation, could be blended together in their proper ratio and the blend would be the same as the original crude oil. In the cracking process, on the other hand, a *chemical* change occurs, and the resulting products cannot be blended back to obtain the original uncracked material.

The cracking process has yielded great benefits to the consumer both in quality and serviceability. Cracking more than doubles the amount of gasoline that can be manufactured from a barrel of crude oil. Thus, although demand for gasoline is steadily increasing, cracking actually conserves huge quantities of crude oil that would otherwise have been drawn from the earth.

The availability of cheap motor fuel has led directly to advances in combustion engine design. More important, the oil industry has manufactured a gasoline better than modern automobile engines can efficiently use.

Year by year, thanks to improved refining processes, the average octane (anti-knock) rating of both "regular" and premium-grade motor fuels has risen. "Regular" gasoline is twice as good today as it was 20 years ago. Yet, excluding the taxes, it costs less than half what it did then.

Motor fuel volatility has likewise been increased. This permits quicker starting and better all-around operation of the motor car.

Another scientific advancement has been the making of natural or "casinghead" gasoline from natural gas, formerly a largely wasted product. Blending this natural gasoline with that refined from crude oil results in improved volatility. New "catalytic" processes, making use of refinery gases, produce the high grade of gasoline required for aviation purposes. No increased consumption of crude is necessary to make this extra fine gasoline. And in no country save our own can this fuel be made so quickly and so cheaply.

Lubricants, so necessary to keeping all forms of machinery in motion, have undergone similar improvement in recent years. Dozens of special oils and greases, to lubricate everything from typewriters to turbines, meet today's requirements.

These are some of the scientific advances in refining to date. More spectacular ones are already on the horizon. Today, in laboratories throughout the country, earnest workers are penetrating more and more deeply into the secrets locked in that black, greasy substance known as petroleum. Improved processes make possible commercial production of gasoline from the heaviest "residuals," the use of almost any crude to turn out the highest refined products, and the making of even higher octane motor and aviation fuels.

Some petroleum technologists predict that the oil industry may become, within a comparatively short time, a gigantic chemical enterprise. They see it supplying the public with innumerable commodities now obtained from other sources. They envision the production of solvents, detergents, explosives, paper, textiles and even food from nature's "black gold."

ROBERT YARNALL RICHIE

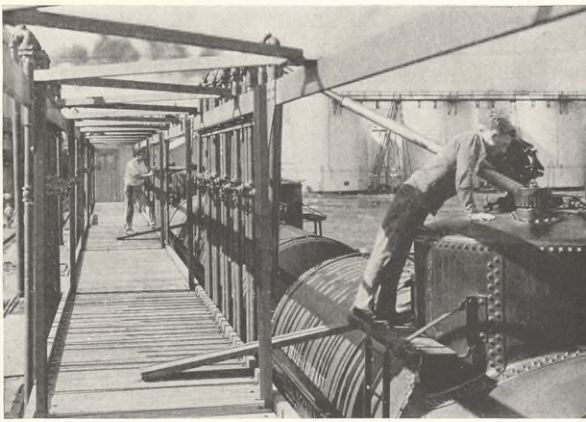
★

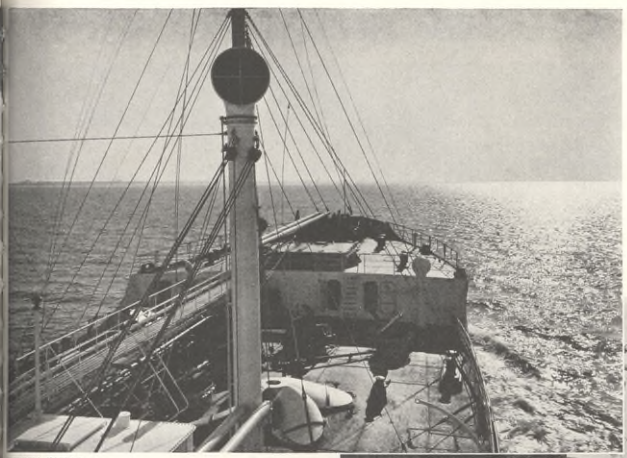
Today, in laboratories throughout the country, earnest workers are penetrating more and more deeply into the secrets locked in the dark, greasy substance known as petroleum

OIL MOVES TOWARD ITS MARKET

(Above) Photo diagram of our Port Arthur Terminal at Port Arthur, Texas. Located on Sabine Pass, it is about three miles from the Company's Port Arthur Refinery. Refined products are pumped from the Refinery to the terminal and re-shipped to all parts of the world. Here also is the Texaco Can Company plant, where hundreds of varieties of tin cans are made. Known locally as "the Island," this Terminal was one of the first properties acquired by The Texas Company. (Right) Railroad tank cars being loaded at Port Arthur Refinery. Despite the huge tonnages of oil shipped by pipe line and tank ship, the oil industry is still the largest single source of revenue for railroads

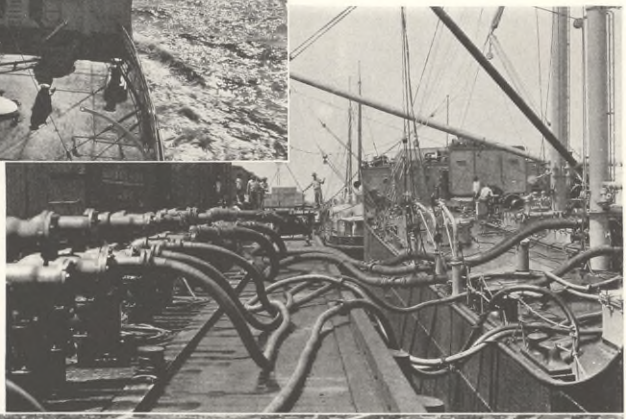
★



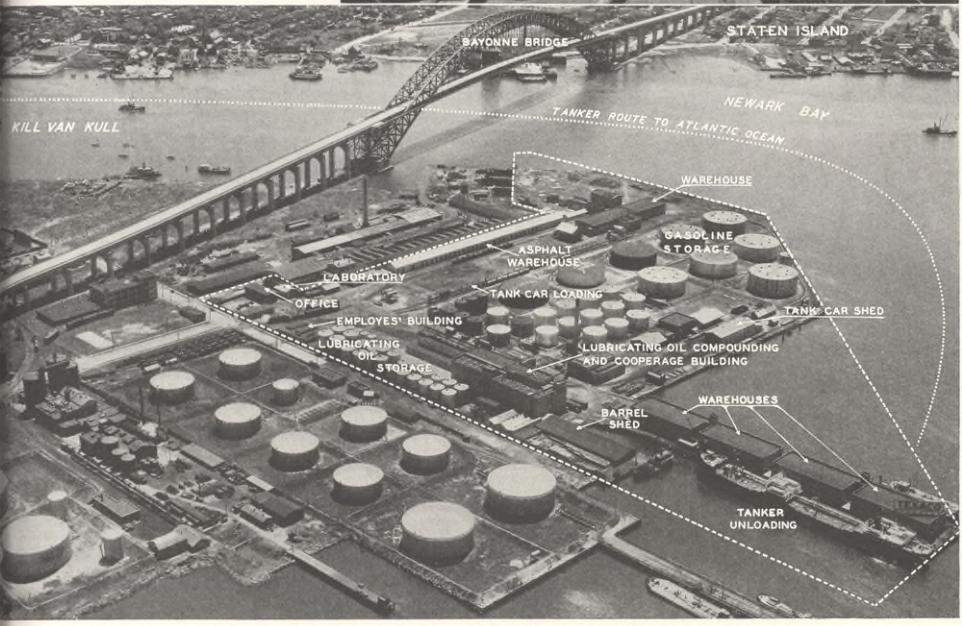


WENDELL MACRAE

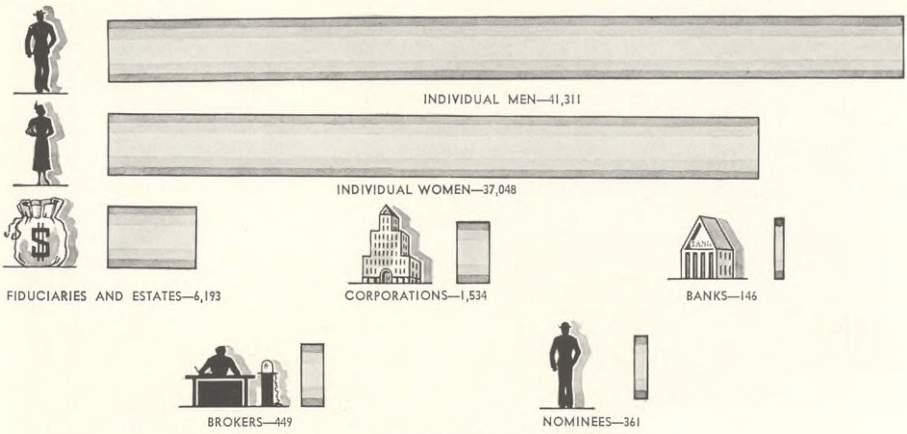
American tank vessels ply the seven seas with their cargoes of crude oil and refined products. The industry as a whole operates more than 1,700 ocean-going tank vessels. Photo at left shows The Texas Company's newest tanker, S. S. *Connecticut*, on a trial run down the Chesapeake. (Below) A tanker loading 17 different grades of oil and a cargo of case goods at Port Arthur Terminal



(Below) An important port of call for Texaco tankers is the terminal at Bayonne, New Jersey. Dotted line indicates terminal area. Here products are stored for re-shipment to bulk plants. Years ago this property was a peach orchard



WHO OWNS THE TEXAS CORPORATION?



TOTAL, 87,042 (as of June 9, 1939)

Of this number, approximately 5,000 are Company employes

21,731 stockholders, or 25 per cent of the total, hold from one to 11 shares
44,162 stockholders, or 51 per cent of the total, hold from one to 28 shares
The average investor's holding is 121.49 shares

No individual owns as much as one and one-half per cent of the stock

TYPES OF STOCKHOLDERS, OTHER THAN INDIVIDUALS AND BROKERS

(AS OF JUNE 9, 1939)

146 banking institutions
139 insurance companies
135 religious groups
134 investment trusts and companies
102 institutions of learning
80 hospitals, aid societies, charitable homes
19 social and fraternal organizations
63 miscellaneous organizations (associations, thrift corporations, art institutes, museums, historical societies, chambers of commerce, libraries)

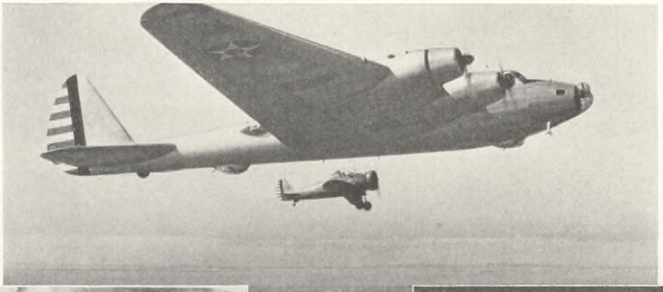
The following table shows the number of stockholders who have held shares in the Corporation or its predecessor, The Texas Company (Texas) for a period of five years or more:

NO. OF YEARS STOCK HAS BEEN HELD	NO. OF STOCKHOLDERS
5 to 9 years	27,530
10 to 19 years	22,022
20 to 24 years	804
25 years or more	243

50,599 stockholders, or 58.61 per cent of the total, have held stock for five years or more

In addition: 110,000 persons, including employes, consignees, bond holders, and crude oil royalty owners, receive payment regularly from the Corporation

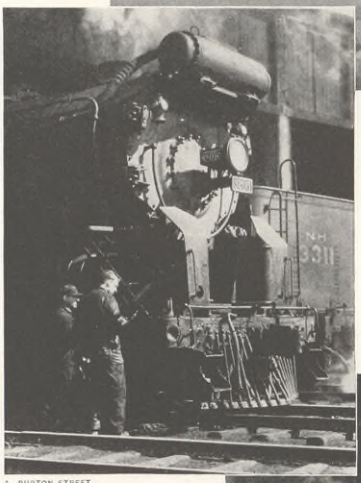
PETROLEUM AT WORK



OFFICIAL PHOTOGRAPH
U. S. ARMY AIR CORPS

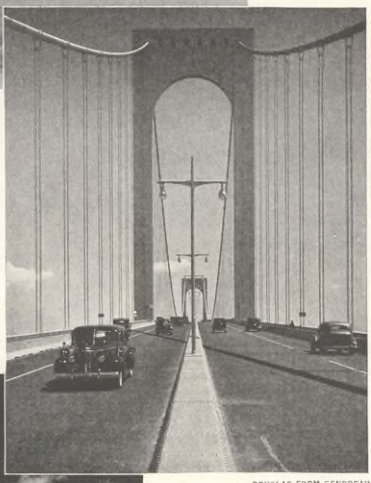
(Above) One of the new superflying fortresses, shown with a pursuit plane

★



A. BURTON STREET

(Above) The railroads use large amounts of petroleum fuel and lubricants



DOUGLAS FROM GENDREAU

(Above) The recently completed Bronx-Whitestone Bridge, in New York City

GENDREAU

IF YOU could harness a billion, 700 million horses together, you would be able to equal the work that petroleum-fueled engines are doing in this country today. More than 85 per cent of this energy is developed by automobiles, trucks and buses. The remainder is spread over manufacturing, aviation, construction projects, electric power and lighting, railway equipment and motor vessels.

Petroleum products are largely responsible for living conditions as we know them today. The gasoline engine permits people to live in one place and work in another, many miles away. It has shortened distances between cities. Gasoline made possible the early electric lights which, although they wavered with each stroke of the piston, nevertheless were far more practical than candles or kerosine lamps.

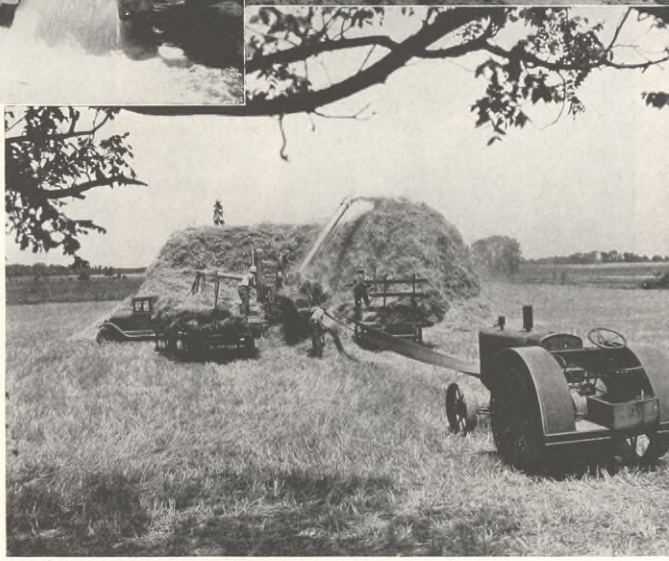
On the farm, petroleum products have lightened the burden of work. They lubricate binders, reapers, cultivators and other implements. They oil harnesses, kill insects, help furnish the family medicine chest, seal preserves with wax, polish floors and furniture, fuel heaters to fight frosts and provide economical farm-to-market asphalt roads.

SNIDER FROM NESMITH

(Right) Tractor disk-harrowing a citrus orchard in Southern California

COURTESY DIESEL POWER

(Above) Flooding ground for bean planting with a tractor-powered Chinese box pump



ALLEN FROM NESMITH

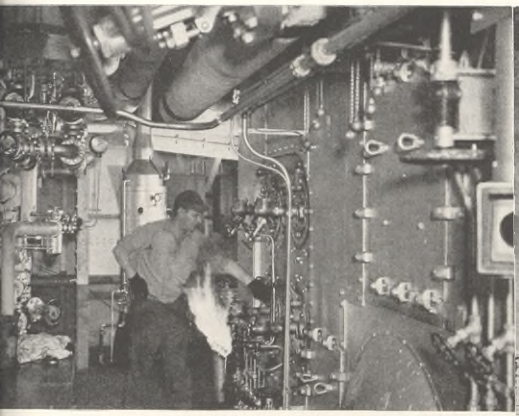
★

(Right) Portable power from petroleum helps with the harvesting in Indiana

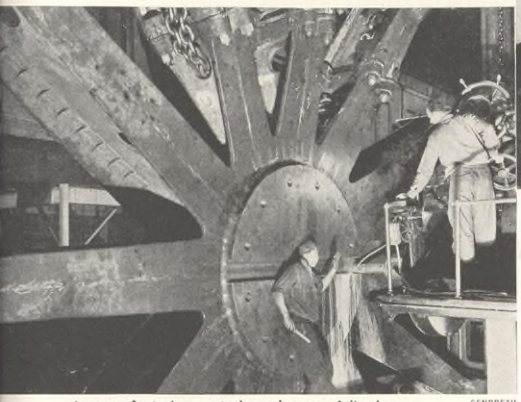
In addition to these physical benefits, oil has brought to many farmers substantial financial returns in oil rentals, bonuses and royalties. To the farmer, as a landowner, the oil industry now pays about 200 million dollars a year. In many states the "crop" from oil is larger than the amounts spent on highways; in others, the oil payments are greater than the total taxes on all farm property.

Petroleum products find highly specialized uses in hundreds of industrial processes. There is no practical substitute for petroleum as a lubricant. In the 60-year period from 1879 to 1939, factory output rose 14 times, or from five billion to 70 billion dollars. But the consumption of lubricants multiplied 40 times. That this demand will continue to grow is indicated by the fact that since 1937 more lubricants have been sold for industrial uses than for any other purpose.

Petroleum and its products have brought comparable benefits to the home. Oil means comfort for vast numbers who live in apartments in our large cities. At the beginning of this year, about 1,650,000 homes out of a total of nine million were equipped to burn oil in central heating plants. In small towns and hamlets, millions of homes would be far less comfortable were it not for kerosine to run cooking

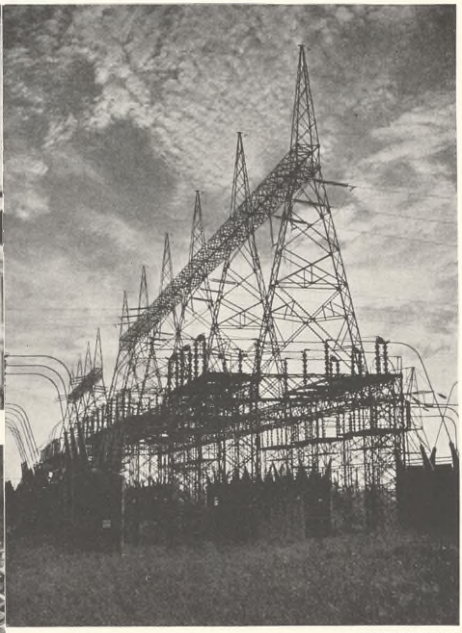


Petroleum is vital to our merchant marine WENDELL MAC RAE



In manufacturing, petroleum has specialized uses GENDREAU

A huge shovel, petroleum-powered and -lubricated SNIDER FROM NESMITH



ROBERT DUDLEY SMITH

The power industry has petroleum for a helper

stoves, lamps, hot water plants, and refrigerators.

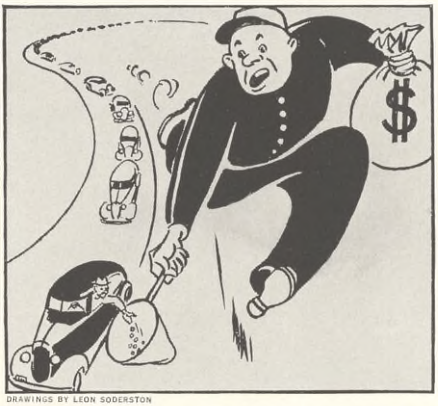
Petroleum is also a vital factor in our merchant marine and national defense. The gross tonnage of merchant oil-burning ships has multiplied more than 13 times in the past 20 years. The Army normally uses a million barrels of fuel oil annually. The Navy requires eight million barrels of fuel oil and 250,000 barrels of Diesel oil. Government aircraft require 36 million gallons of gasoline a year, and more than a million gallons of lubricating oil.

In the oil industry itself, security of employment is well known. Seasonally, the industry as a whole has few shifts in employment—oil workers are employed on a more even basis throughout the year. With an annual payroll approximating a billion and a half dollars, employment in the industry in 1936 had increased seven and one-half per cent over 1927. Wage rates and hours are among the best in all industry.

The oil industry has been a leader in establishing good working conditions. Accidents have decreased both in number and severity.

The industry has also promoted sanitation in plants, and given its employes paid vacations, accident and sick benefits, permanent and total disability coverage, group life insurance, and retirement pensions.

PETROLEUM TAXES



DRAWINGS BY LEON SODERSTON

FROM THE moment crude oil comes out of the ground until it is delivered to the purchaser in the form of finished products it is subject to taxes on the part of Federal, state, and local governments. Taxes today equal the industry's annual payroll, and exceed its earnings.

Except for gasoline taxes, the petroleum industry considers most of these levies reasonable in themselves. It is their multiplicity and duplication which make them burdensome.

Retail gasoline sales bear the brunt of the tax burden and directly affect every person who drives a car. And because motor fuel taxes are collected on a per-gallon basis, not fluctuating with changes in prices, last year's gasoline tax collections increased in the face of declining retail prices.

Gasoline taxes come out of the motorist's own pocket, and in most cases too painlessly. The service station man collects, and the motorist usually looks upon the tax as part of the cost of the gasoline itself.

Years ago ownership of an automobile was synonymous with wealth. Today's average car owner earns $30 a week or less. His automobile is worth only $200. He drives it between his home and his job and occasionally for week-end pleasure trips. He thinks his gasoline tax money is used to pay for the roads on which he rides.

That was the original purpose of the gasoline tax as enacted in Oregon in 1919. The policy was followed for about 10 years, during which period all states in the Union passed similar legislation. Then, in 1928, someone had what looked like a great idea—why not divert some of the golden stream of gasoline tax receipts to other than road purposes?

The set-up was ideal—a "painless" tax, collected by the oil industry, and receipts steadily mounting. Year by year the funds (swelled since 1932 by the "temporary" Federal tax as well) have been diverted and dispersed for non-highway purposes. Today more than 16 cents out of every gasoline dollar is so mis-used.

Since 1924 this amount of diverted receipts has passed the billion-dollar mark. Needless to say, had this gigantic sum been applied properly to highway construction and improvement, the nation's roads today would be safer and more comfortable. But one dollar out of every eight collected from the motorist by the oil industry now goes for other purposes.

Although there are three million miles of roads in this country, less than 600,000 miles are in an improved condition. Secondary roads, which could be improved at relatively little cost, lie deep in mud or covered with broken, ancient paving.

The petroleum industry has a tax bill of its own which at present amounts to one and a quarter billion dollars a year. Tax proponents argue that the industry can afford to pay this "for utilizing a natural resource." But the industry's raw material has value only after it has been converted into useful products and delivered to places where those products can be easily obtained.

The oil industry does not object to contributing a fair share of its revenue to the tax collector. But it does oppose high, discriminatory taxes, multiplication and duplication of levies, and diversion of highway funds for miscellaneous purposes. It feels that unnecessary taxes, which are passed on to the consumer, add heavily to the prices of its products —gasoline particularly—and are directly responsible for some of the industry's most difficult and pressing problems.

PIONEERING on an OLD FRONTIER

THE latest big producing frontier of the petroleum industry is southern Illinois. Intensive drilling has been going on there since 1935, and this state, which produced small quantities of oil from 1882 to 1905, has now forged to the front in crude oil production.

Not until 1905, when oil was discovered in its southeastern part, was Illinois considered seriously as an oil-producing state. Between that year and 1910 its output climbed to about 100,000 barrels of oil a day. From that peak the production declined gradually until by 1936 the old areas were producing about 12,000 barrels a day. In all, these old fields in Illinois accounted for some 430,000,000 barrels of oil.

Between 1910 and 1936 only three or four unimportant new fields were discovered, although wildcatting was fairly active. These wildcat operators seem to have been a particularly unfortunate lot. Based on averages alone, they should have had better luck, for it is now known that oil pools in the southern part of the state are numerous.

The unluckiest of these wildcat operators was one who drilled within what is now the producing area of the great Salem Field but stopped 40 feet short of bringing in a discovery well. If he had been successful then, the course of petroleum history during the intervening years might have been changed considerably.

It remained for the year 1935 to change the producing horizon. For a long time the big, active oil fields have been west of the Mississippi. Early that year the interest of oil prospectors was drawn back to the old Illinois frontier by publication of the Illinois Geological Survey. One by one the industry's operators, large and small, flocked into the state with geologists, seismograph crews, and lease scouts. They all found conditions encouraging.

When intensive drilling began, no one was expecting a tremendous new oil field. Many companies were, like The Texas Company, looking for a good source of local crude to supply their Midwest refineries. A large part of the crude used in The Texas Company's refinery at Lockport, Illinois, and Indian Refining Company's plant at Lawrenceville, was being brought from a considerable distance by pipeline.

From a total Illinois production of 4,475,000 barrels of oil in 1936, all from the older pools, the figure rose to 7,499,000 barrels in 1937. Even in the Spring of 1938, Illinois was still a potentially unimportant source of supply of crude oil. A few months later, after The Texas Company had brought in a well on its Salem Prospect that attracted much attention, the region was the most active producing area in the United States.

Desirous at first only to build up enough production to supply the Lawrenceville refinery with Illinois crude, The Texas Company found itself drawing enough petroleum from the ground to replace purchased crudes brought from a distance not only to Indian Refining Company, Lawrenceville, but to its Lockport Works as well, and also to bring its Pryse Works, in Kentucky, up to full operating capacity.

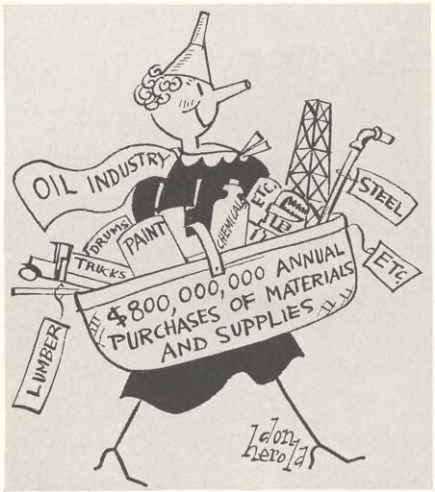
So rapidly did the Salem Field grow that in its early days producers found it difficult to move the crude to refinery markets. Before pipe lines were laid, large quantities were moved by truck and by rail. The pipe lines, some of them owned wholly or in part by The Texas Company, are now linked up so that crude goes to the refineries chiefly through them.

Of the 1,300 wells which have been drilled in the Salem Field as this is being written, 190,000 barrels of oil were being produced a day. The Texas Company's share of this production was 107,000 barrels from 740 wells. The Company's total production in Illinois was 110,000 barrels.

Production in Illinois is not prorated. Because of the lack of proration, with consequent unrestricted production, some of the development has been wasteful and uneconomic.

The Texas Company would welcome state regulation that would curtail production and protect oil reservoirs from unduly rapid waste of reservoir pressures and too rapid an encroachment of water. A proration bill was introduced in the last session of the Illinois legislature, but died in committee after state-wide hearings were held. A special Fall session of the Illinois legislature will doubtless be called and it is hoped that at this session an adequate proration law will be enacted.

PETROLEUM IS A GOOD CUSTOMER



DRAWINGS BY DON HEROLD

ALL business benefits by the well-being of the oil industry. As a purchaser of equipment, materials and supplies, petroleum contributes directly to the welfare of other industries. As an employer it benefits other industries through purchases made by its employes.

The oil industry's annual bill for materials and supplies is about 800 million dollars. In the steel industry alone, purchases by petroleum producers and pipe line operators amount to a million and a half gross tons of iron and steel in countless forms. The payrolls thus created amount to millions of dollars and keep thousands of workers employed.

Hundreds of other industries help to fill petroleum's market basket. Such items as chemicals, rubber, tools, trucks, office supplies, steel drums, pails, buckets, tin cans, paint, lumber, bricks, cement, precision instruments and electrical appliances are bought in huge quantities.

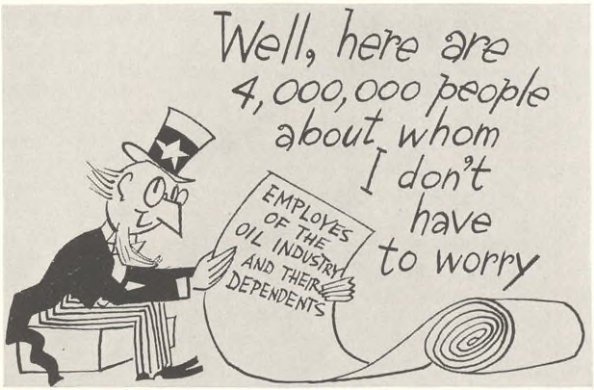
The oil industry is the largest single source of income to the railroads, being responsible for nearly 10 per cent of the total carload freight revenue. As the owner of 1,700 ocean-going tank ships and hundreds of river and harbor vessels, the industry is an important customer of American shipyards.

Far more sizeable and effective than its direct purchases, however, is the flood of cash that flows from the industry's employes into the coffers of every business. Workers in the oil industry share an annual payroll of a billion and a half dollars.

Oil company employes are good customers. Their rates and hours are among the best in all industry, and their employment is more constant than in most other industries.

The petroleum industry utilizes the brains of all the professions and the brawn and skill of all trades. Its wages go to a million employes and are the source of livelihood for them and their three million dependents—four million people that Uncle Sam doesn't have to worry about.

Any community that has a service station, wholesale plant, pipe line station or refinery benefits from



oil company wages. Oil builds good towns to live in, erects school houses and supports universities. Retail outlets alone enjoy a 900-million-dollar volume of trade from the petroleum industry. Increased efficiency, resulting in better products at lower prices, has helped to boost the automobile industry.

Petroleum and its products not only are necessary to every other industry, but are largely responsible for our machine technology and our mechanized civilization. Every industry and individual benefits directly or indirectly from them.

PRINTED IN U. S. A.
THE CONDÉ NAST PRESS, GREENWICH, CONNECTICUT


NC14932
TWA
TEXAC
TWA
TWA

Good housekeepers approve:

We've had a big surprise —

Of course, we felt sure you'd *like* our fully-equipped *Registered* Rest Rooms, our signed pledges to keep them spic-and-span, our "White Patrol" inspection cars in every State.

But we weren't prepared for the avalanche of appreciation — the hundreds of letters you've written, the thousands of daily "Thank You's" at our stations.

Here is our answer. You will now find our clean, fully equipped *Registered* Rest Rooms at Texaco Dealers all over the United States—more of them every day. And we'll give you the best in gasoline, oil and service, too.

Look for the neat green-and-white signs that mark our *Registered* Rest Rooms at Texaco Dealers everywhere. We invite you to drive in.

TEXACO DEALERS

originators of REGISTERED REST ROOMS

Texaco "White Patrol" inspection cars, like the one shown below, guard *Registered* Rest Rooms. Many inspectors have first-aid training and carry first-aid equipment.

SKY CHIEF sells for about half the price you paid in 1920 for the then regular gasoline, illustrating the continued success of the petroleum industry in providing the public with better products at lower prices.

Published in behalf of more than 45,000 independent Texaco Dealers by The Texas Company . . . makers of Fire-Chief and SKY CHIEF Gasolines, Insulated *Texaco Motor Oil,* Insulated *Havoline Motor Oil, Marfak and more than 350 Industrial Lubricants.*