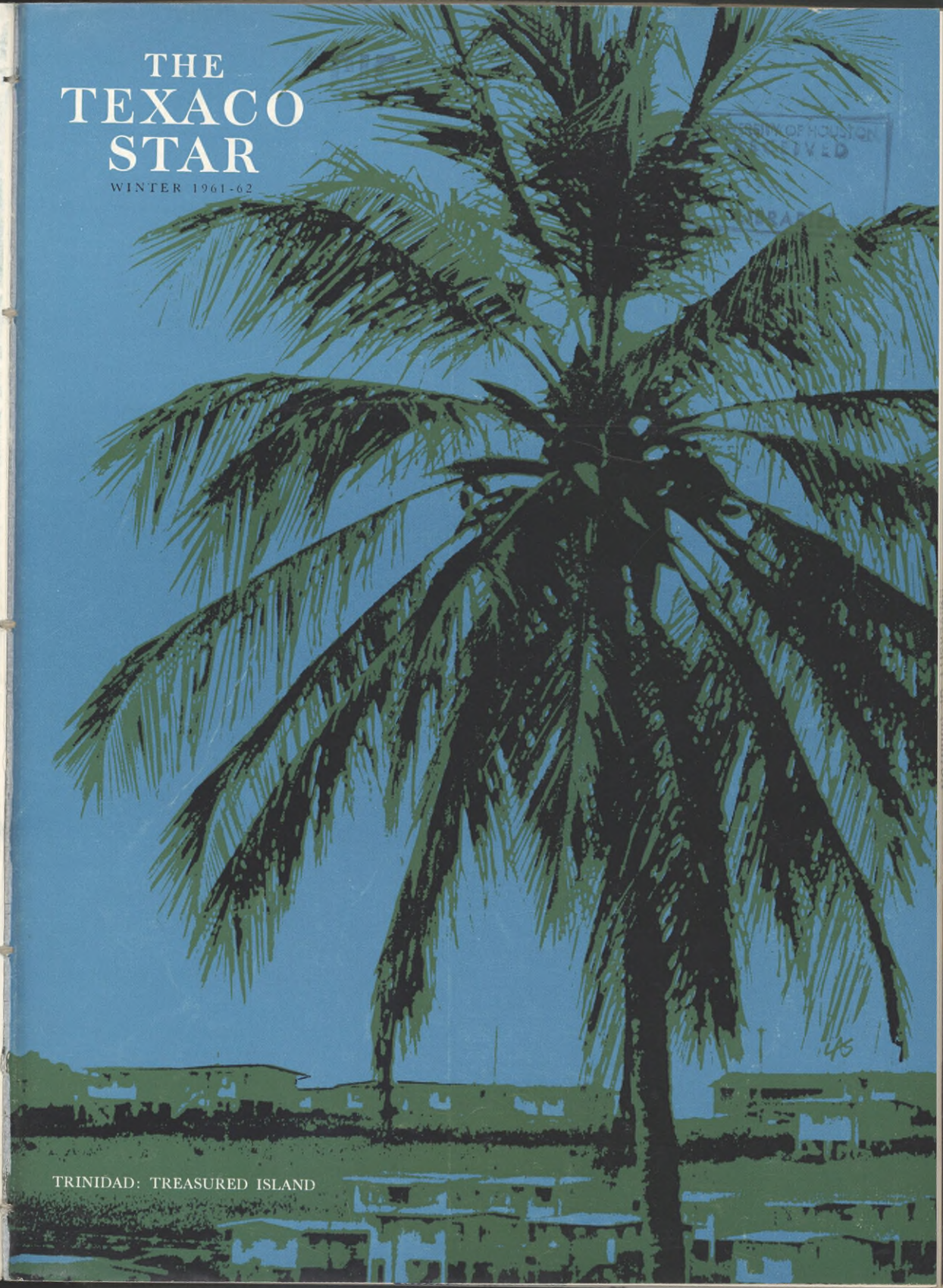
THE TEXACO STAR

WINTER 1961-62



TRINIDAD: TREASURED ISLAND

WHAT'S WRONG AND RIGHT WITH PROFITS?

by Augustus C. Long, Chairman of the Board

Perhaps the least understood aspect of American business is the role profits play in a free economy. The need for a fuller understanding of that role was stressed in an article Texaco's Board Chairman wrote for the September, 1961, issue of Dun's Review. *Because of the interest its subject holds for Texaco stockholders and employes, a condensation of the article is published here.*

THE CONFLICT between communism and capitalism is not so much physical or military as it is a struggle for men's minds. If people clearly understand the principles of capitalism and the opportunities it affords, they will not readily forfeit the freedom that allows capitalism to survive. Freedom is the only climate in which capitalism can flourish.

If this argument is valid—and I think it is—then all of us who recognize our stake in the free enterprise system have before us a major and pressing task. That task is to provide the public—and in some cases their representatives in government—with a fuller comprehension of the workings of capitalism. For if they do not understand its basic principles, they cannot be expected to appreciate why it is superior to a state-dominated communistic economy.

The very words "free enterprise" sum up the essential difference between the Soviet and American economies. In the Soviet Union a bureaucracy determines how many shoes and spoons and automobiles are to be made, in what color and size, and at what price. The consumer is not consulted.

Under free enterprise, on the other hand, the consumer can spend his income any way that will give him the most satisfaction. And there is only one way that the motivating force of capitalism—the prospect of profit—can be realized. That is to manufacture a product or render a service that is attractive to consumers both in its quality and its price.

Without the incentive of profit our free enterprise economy could not operate successfully. Yet profits have come to be associated in many people's minds with something undesirable and improper. A generation of sniping by "reformers" in and out of government has erased, for untold numbers of Americans, the distinction between "profits" and "ill-gotten gains."

These people do not understand—perhaps because they have not been told—what happens to what is left of a company's income after it pays its taxes and other costs of doing business. This lack of understanding can easily lead to the belief that these profits are, in fact, a kind of special fund, privately administered, that is siphoned off into the pockets of a few persons. Obviously, no one laboring under this sort of misconception can be expected to have faith in a system that would allow such a situation to exist.

The business community has the responsibility to explain to the public what profits really are and what they represent. Profits are the rewards for taking risks, for making innovations, for meeting consumer requirements and desires. Profits are the source of increased employment and of rising wages. And profits are an essential factor in making possible the investment capital required for economic progress. There has never been a period in our history when a high level of investment has not been associated with a high level of employment and general prosperity.

Profits provide the return a company makes to its stockholders, in the form of dividends, for the use of the tools their investments have supplied. And because there was no assurance at the time investments were made that the venture would succeed, whatever profits are realized represent not only a payment to the stockholders for the cost of using the tools, but a reward for taking risks.

If a reasonable return is *not* made to stockholders, a company will find that in today's highly competitive market it cannot attract sufficient investment capital to carry on effectively and expand its operations. In a dynamic, growing society, business cannot afford to remain static.

Nor has it. The record shows that, in the postwar period alone, the average investment for each production worker in the manufacturing industries rose from about $7,000 in 1946 to approximately $18,000 in 1959. The effect of this has been to increase both the quantity and quality of tools provided by industry to supplement the efforts of labor. As a result, the output of the entire economy per hour of labor has risen at an average rate of 2.4 per cent annually since 1900. The amount produced with an hour's labor has been doubling every 30 years.

From the beginning of this nation's history, the prospect of profits has been responsible for generating our unparalleled output of goods and services. It has made possible our high national level of income and standard of living, and it holds forth the promise of even greater achievements in the future.

All these things are what is "right" with profits. But just as this story must be told if business is to win the confidence and loyalty of the public, there is another story that also needs to be told. This is the story of what is "wrong" with profits, and I suspect that even some businessmen do not fully appreciate its significance.

What is wrong with profits is that there are not enough of them. No matter how they are viewed, it is impossible to escape the conclusion that in recent years this motive force for enterprise and risk-taking has been inadequate to do the job our expanding national economy requires.

In 1950 all corporate profits before taxes amounted to 16.8 per cent of the national income; in 1960 they had fallen to 10.6 per cent. In 1960 corporate profits after taxes were about the same as the amount earned 10 years earlier—$22.8 billion—but this was actually a decline of more than 20 per cent when inflation is considered, as it must be.

OVER THIS SAME PERIOD the after-tax profits of leading manufacturing corporations fell from 17.1 per cent to 10.5 per cent, measured as a return on net assets. And whereas these profits came to seven cents per dollar of sales in 1950, by 1960 they had fallen to about four-and-a-half cents.

However, the profits situation is even more serious than these data reveal. As a result of inflation in the postwar years, the costs of replacing worn-out plant and equipment have risen well above the depreciation permitted for tax purposes. So, industry has been forced to use part of its profits to make up this deficiency.

It is apparent from these facts and figures that profits are in grave danger of dwindling to the point of all too little return. Yet it is not necessary to refer to statistical tables and abstract theories to appreciate the very real threat this poses to the economic progress of the American public.

Whereas expanding profits contribute to the creation of jobs and to job security, the depressed earnings of recent years have forced many companies to retrench all along the line. This, in turn, has led to a very high level of unemployment throughout the country, in some areas to critical conditions. Certainly this is not a climate

favorable to restoring and maintaining a high level of employment. Even Samuel Gompers, while president of the American Federation of Labor, recognized the importance of profits when he stated: "The worst crime against the working people is a company which fails to operate at a profit."

The profits squeeze also has created a deficiency in the level of investment in new plant and equipment. Granted that consideration must be given to the ups and downs of such expenditures as a result of cyclical movements, the fact remains that the all-time high point in the history of this country's investment outlays was reached in 1957. Furthermore, in the light of the present outlook for profits, the prospects for exceeding that investment level in the near future are uncertain.

DURING THE PAST 10 years the United States has put only 15 per cent of its total output into capital formation, which includes the output of producers' durable equipment as well as the activities of the construction industry. (In this same period, Japan, Germany, Italy, the Netherlands, Canada, Norway, and Sweden were all investing 20 per cent or more of their total output in capital goods.) As a result, it is estimated that approximately half of our present industrial capacity is of wartime or even prewar vintage, while some two thirds was installed before 1950. This aging stock of plant and equipment has presented serious problems involving our balance of payments position and our international trade.

Looking ahead, it is estimated that plant and equipment requirements for the present decade will approximate $500 billion, or about $200 billion *more* than was invested in productive facilities over the past 10-year span. Yet in many cases the effect of inadequate profits has been to postpone plans for necessary expansion. This, of course, is bound to continue to exert a depressing influence on the labor market.

It is apparent that this widespread contraction of profits is seriously affecting not only the private sector of the economy but the public sector as well. Inevitably, such a general decline results in lowered tax revenues to Federal, state, and local governments. For example, as a result of the falling-off of profits between the first and fourth quarters of 1960, corporate tax liability dropped $4 billion at a seasonally adjusted annual rate.

It may be seen, therefore, that the continued reduction of profits, if left unchecked, may set in motion a rapidly descending spiral of business activity, impairing the entire economic structure and weakening the nation both internally and in international affairs. The consequences are readily apparent. Whenever a private enterprise economy breaks down, the inevitable result is that the government vastly increases its direct participation in, and control over, the economic life of the nation. And we have seen the results of such governmental intervention in nations abroad.

We cannot hope to win the cold war by aping or emulating those nations that have handed over their liberties to the state. Freedom from state control is the very principle that distinguishes democracies from dictatorships. To take such a course would be to deny our entire heritage.

I have no concern over the continuing integrity of the American spirit. I do, however, have very serious concern over the ease with which that spirit could be frustrated by the simple process of economic drift. And that drift, already running more and more strongly against us, can be successfully opposed only by restoring profits to healthy levels.

Every one of us has the responsibility to work for the revision of our obsolete tax laws, to strive unceasingly in the fight against inflation, to defend the right of business to exist and function without governmental harassment. Only when we succeed in accomplishing these things can we insure the continued strength and vigor of capitalism. •

THE TEXACO STAR

THE COVER: A special photographic process that reduces full-color illustration to flat, stencil-like forms was used to picture Plaisance Park—a project developed to provide low-cost housing for hundreds of Texaco Trinidad people. The housing is just one of several important programs the Company has undertaken since its purchase of The Trinidad Oil Company Limited in 1956. "Trinidad: A Five-Year Report," beginning on Page 3, recounts the others.

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Trinidadian hills come down to make room for new structures at Texaco's Pointe-à-Pierre refinery. Vast sweep of project is pictured at top against background of present facilities. Above, *big bulldozer shoulders earth into the sea.*

TRINIDAD
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TRINIDAD
A FIVE-YEAR REPORT

SOMETIMES AN OIL COMPANY must move mountains of earth to market molecules of petroleum. That is just what Texaco currently is doing in Trinidad: in a land reclamation project near the Company's Pointe-à-Pierre refinery, the hills of Simpson's Point—800,000 cubic yards of earth—are being pushed into the sea to provide an area for the product tanks, compounding and packaging facilities, and warehousing of a new lubricating plant that will supply the growing Caribbean market (see "New Refining Facilities Planned," Page 21).

Moving mountains is ambitious work, but the Pointe-à-Pierre project is no more remarkable than some of the other changes Texaco has been responsible for on the Island since it acquired The Trinidad Oil Company Limited five years ago. Texaco Trinidad, Inc., today is one of the Company's most successful operations; and, in a number of ways, Trinidadians have benefited even more from the 1956 purchase than the Company.

When Texaco acquired Trinoil, it undertook certain obligations. Briefly, these embraced the following considerations:

- The Trinidad refinery was to be operated at full economic capacity and if possible expanded.
- Exploration in Trinidad was to be intensified.
- Existing oil resources in Trinidad were to be exploited on the basis of sound operating practice at the maximum economic rate.
- Industrial relations were to be maintained on the basis of existing and established practice.
- There was to be fair treatment of existing personnel and training of as many local men as possible to take high positions in the Company.
- There was to be no racial discrimination in any of the Company's plants or camps and the rights of local persons were to be respected.

Today, five years later, a look at the record shows that the Company has more than met its obligations.

In 1956, the Company drilled 58 new wells in Trinidad;

by 1961 the figure for the year had increased to 117. Production of crude oil in 1956 averaged 32,500 barrels a day. By mid-1961 the average daily production had been boosted to almost 60,000 barrels.

One of the accomplishments accounting for this very substantial production increase has been the construction, off the west coast of the Island, of the world's largest fixed marine drilling platform on a piled structure. This year, Texaco completed its 36th well from that platform.

Farther south, in conjunction with two other oil companies, Texaco has acted as operator of marine concessions in the Gulf of Paria. So far, 100 wells have been completed in this venture, and the oil produced from them is pipelined ashore to join the existing onshore pipe line network feeding into Pointe-à-Pierre. Today, Texaco Trinidad produces roughly half of the Island's crude oil.

In refining, the Company has made even more impressive advances. When the Pointe-à-Pierre refinery was taken over by Texaco, its average daily throughput was about 75,000 barrels a day. By 1958 that figure had been upped to around 125,000 barrels a day, and now the plant's capacity is 235,000 barrels daily — making it Texaco's second largest refinery and one of the world's largest.

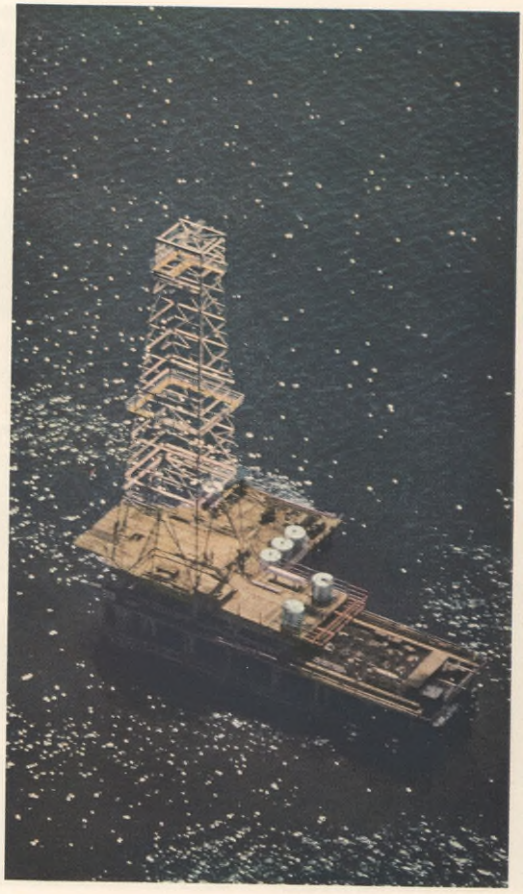
During World War II, what amounted to another refinery was added to the existing plant at Pointe-à-Pierre to multiply many times over the production of 100-octane aviation fuel for Britain's Royal Air Force (many of the Spitfires that beat off the *Luftwaffe* during the Battle of Britain were fueled with gasoline from Pointe-à-Pierre). Later in the war the plant supplied our own Army and Navy Air Forces in Trinidad and North Africa. It also served as a fueling source for the U. S. Navy's South Atlantic fleet. For security reasons, this refinery expansion was known as "project 1234."

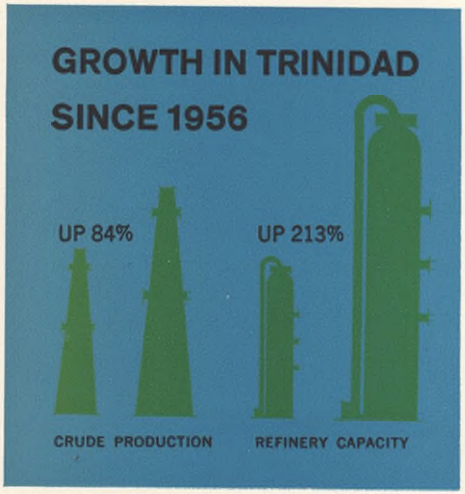
Out of sentiment as much as for any practical reason, subsequent additions to the refinery have carried on the numerical project sequence. In 1957 Texaco Trinidad began "project 1235," which included construction of the world's largest Rexformer (used to make high-octane motor gasoline stock). "Project 1236," completed in 1960, included the construction of a 100,000 barrel-a-day crude unit, a 20,000 barrel-a-day Hydrotreater, and a second Platformer of 15,000 barrel-a-day capacity. The extraction section of the Rexformer was modified earlier this year to produce aromatic concentrate, the base ingredient of a benzene-toluene concentrate now being shipped to United States users.

Substantial additions to tankage, shipping, and harbor facilities also have been necessary at Pointe-à-Pierre. Today the tank farm in the refinery area has a storage capacity of well over eight million barrels.

Texaco Trinidad's need for imports of crude oil, to supplement production on the Island, has risen from a 1956 figure of 21 million barrels a year to over 60 million barrels in 1961. This has meant a large investment in supertankers: an average of one supertanker cargo every three days is needed to supply the expanded refinery throughput. Imports come mainly from South America, the Middle East, and the Far East. Most of these imports are Safaniya crude oil shipped from Ras Tanura in the Persian Gulf, which has become

Texaco supertanker, left, *is one of the fleet that delivers shipments of crude oil to Pointe-à-Pierre on an average of every three days. The fixed marine drilling platform about a mile off the west coast,* below, *is the largest of its kind anywhere in the world.*





Texaco Trinidad's finished products have become leading sellers throughout the Caribbean, a growing market. Below, *a modern Texaco station serves Port-of-Spain motorists.*

a major loading point for the oil produced by Arabian American Oil Company (Aramco) — an affiliate in which Texaco has a 30 per cent interest. To meet delivery schedules at Pointe-à-Pierre, there is a supertanker every 500 miles sailing between Saudi Arabia and Trinidad, around the Cape of Good Hope.

Texaco Trinidad is an integrated oil company in itself. Exploration, production, transportation, refining, and marketing — all have become familiar to Texaco Trinidad employes to some degree. The Company maintains a work force of some 8,000, making it the Island's largest permanent employer, and Trinidadians on its payroll receive a number of benefits other than the basic one of steady employment.

An important fringe benefit Texaco Trinidad offers is help with the financing, planning, and building of employes' houses. Under the Company's housing plan, hundreds of employes have been enabled to build their own homes, thus giving added support to the Trinidad government in its effort to provide needed housing for its people.

Another benefit provided by Texaco Trinidad is a medical department that operates a comprehensive medical service with seven full-time doctors in attendance. Employes' wives and families, as well as the workers themselves, are eligible for the medical benefits provided. The Company maintains two hospitals, with a total of 56 beds, and an outpatient center — all at Pointe-à-Pierre — and clinics at each of its main producing fields.

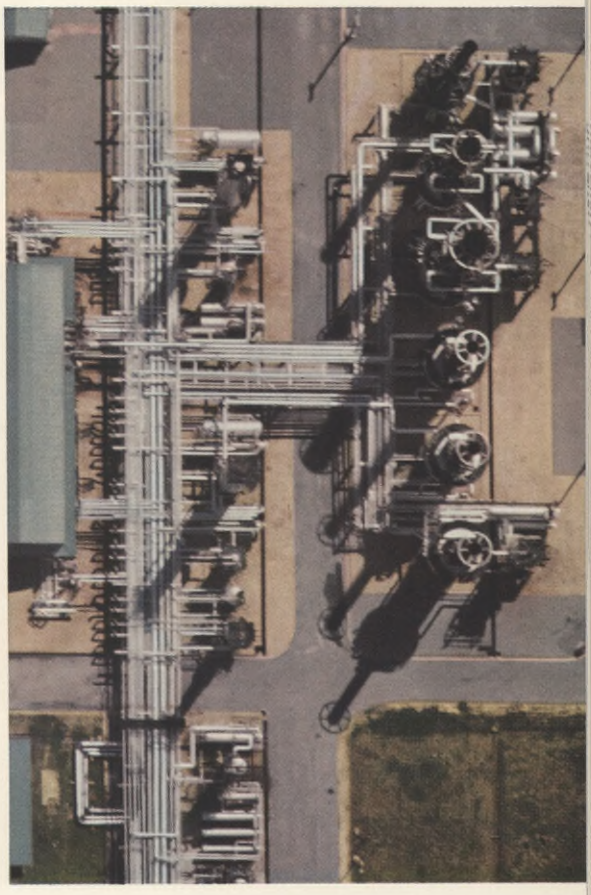
The Company also has established training programs for student and trade apprentices and stenographers; and one-year courses to help selected employes meet the educational requirements of the more responsible jobs. As a result of these programs, it won't be long before a total of 1,000 young men have received training and increased their earning potentials.

Texaco Trinidad has donated and helped build schools in several areas where it is operating on the Island. Grants also have been made to other educational institutions — colleges and technical institutes among them. Company scholarships are awarded at the high school level and also to universities and colleges in the West Indies and Britain. Trinidad has had strong ties with Great Britain—and as it moves toward independence, whether or not as a unit of the West Indies Federation, it will retain those historic ties as well as its relations with other members of the Commonwealth.

West Indians are well-known as cricketers, but they are also avid track and field sports fans, and one of the things that has given Trinidadians huge pleasure is the Texaco Sports Club at Pointe-à-Pierre with its fine cricket field and other playing grounds. The club, which each year sponsors the Southern Games with participants from all over the West Indies, is considered the best-managed in the Caribbean. Although no one would compare the importance of a new track record to the importance of a new house, the Company's contribution to the Caribbean area's enjoyment of sports makes a pleasant adjunct to its more far-reaching contributions. It seems likely that it also has made a lot of friends throughout the Caribbean. Texaco has become a leading marketer in this important area — and the market is growing.

With crude oil production nearly doubled and refining capacity more than tripled, Texaco Trinidad is well on the way to becoming one of the world's more important oil centers. The acquisition of Trinoil some five years ago gave Texaco the flexibility it needed to balance out Eastern and Western Hemisphere operations. And most Trinidadians today will agree that this move has also given greater stability and long-range benefits to the Island's economy. •

Capacity of the Pointe-à-Pierre refinery, a section of which is shown below, has been more than tripled since 1956. It is now Texaco's second largest, and one of world's leaders.



Aubrey Duke, a machine shop foreman, and his family have lived in Plaisance Park nearly two years. Duke's son, Winston, is a Company apprentice-trainee.

ABOUT FIVE MINUTES DRIVE from Texaco Trinidad's Pointe-à-Pierre refinery, curving streets lined with pert bungalows make up a housing development *(below)* called Plaisance Park. To the owners of these homes, all Texaco Trinidad employes, Plaisance Park represents one of the most important single Company benefits they enjoy.

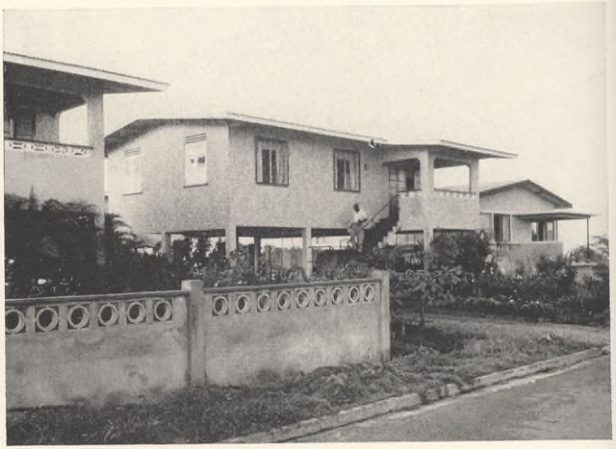
The project was begun about three years ago when the Company, recognizing that Trinidad's rapid population increase in recent years had created a housing shortage not unlike that every fast-growing community faces, decided to make a large parcel of its land near the refinery available for home building by employes.

After clearing and landscaping the property, the Company put in roads and a sewage system, and established a water supply. It then subdivided the land into 50 x 100-foot lots and offered these for lease to qualified employes at the very easy to handle annual rate of about 24 dollars. It also guaranteed bank loans for homes and put together a list of reputable contractors employes might call on for the construction work.

The couple at the left are shown in their Plaisance Park home, which they and their two children moved into

Living Better, Learning More

The comfortable home, top right, *is typical of those employes have built in Plaisance Park — a Company project minutes from Pointe-à Pierre refinery.* Center, *a Texaco Trinidad couple do their week-end shopping in the well-stocked supermarket that was opened principally to serve employes at Plaisance Park. Employes' sons,* bottom, *participating in one of the Texaco Trinidad apprentice training courses, receive invaluable training while still in their teens.*



during the spring of 1960. They take obvious pride in their home and in a thriving garden that produces lettuce, tomatoes, and flowers. The man is Aubrey Duke, a 27-year veteran in the oil business and a foreman in the Pointe-à-Pierre machine shop. By almost any standard, he and his family live well. By Caribbean standards, the family lives very well indeed, and so do the other Plaisance Park home owners. Quite aside from what it has meant to Texaco Trinidad employes, the Plaisance Park project has been measurably helpful to Trinidad's government, which is working hard to provide minimum housing for its people.

Many of the families living in Plaisance Park have youngsters who also work for the Company, and a good number who attend one of Texaco Trinidad's training courses. The Trade Apprentice Program was established to create a continuing source of skilled hands, and has proved very successful—as has the Student Apprentice Program, which is aimed at developing a cadre of junior supervisors. Help with a young person's formal education is available, too: Texaco Trinidad has established one program that provides secondary schooling for a certain number of employes' children who qualify, and another that makes available scholarships at colleges and universities in the Caribbean and Great Britain.

Plaisance Park provides tangible evidence of Texaco Trinidad's sincere interest in the people who work for it. •

There seems no reason to tamper with the right to buy what we like—in fuels or any field

SHOULD USERS BE CHOOSERS?

THE MOST SIGNIFICANT ACTIVITY on Capitol hill in 1962 affecting oil and gas will revolve around the fuels studies in the Senate and the House . . . with the outcome expected to have an important influence on imports, gas, and natural resource taxation."

That prediction was made in September by a leading business magazine in the petroleum field, and the fuels studies it mentioned could easily affect everyone in the nation. Basically, they will revolve around one point: should consumers continue to have a choice among fuels, or should they be told what to buy?

To a nation that has grown, and prospered enormously, on an economic system that gives the individual the right to pick and choose in the market place, the serious discussion of a question like this seems unproductive. Still, they probably *will* be discussed very seriously during 1962 by the Senate Interior Committee and the House Small Business Subcommittee, as those two groups continue their investigations of the need for a national fuels policy.

A good part of this nation's success has been its ability to "stay loose," economically—to be free to select what is best at any time. In fuels, what was best a century ago is not necessarily best now; and what is best now won't necessarily be first choice in 2062. Atomic energy is beginning to make its impact felt, and there is much discussion of the fuel cell and solar energy.

However, petroleum hydrocarbons—crude oil, natural gas, and natural gas liquids—have been the nation's leading energy source for many years and possess the flexibility to maintain that leadership far into the foreseeable future—through continuing research and product improvement. Right now they supply more than 70 per cent of America's energy. There is little reason to believe that (if we continue to rely on the free market system) petroleum's contribution will be lessened visibly in our lifetimes.

Right now, coal leaders are attempting to persuade Congress that a "National Fuels Policy," constructed along lines they have developed, should be adopted. At the heart of that policy would be a provision that would restrict the uses to which consumers could put oil and natural gas. In essence this would mean the start of what are called "end-use" controls. This phrase is applied to Government controls that would regulate the use that can be made of petroleum.

The coal interests maintain that in order to conserve our petroleum supplies, Government controls should require broader use of coal. There is enough coal left to supply us for hundreds of years, they say, so why not use it for "inferior" uses such as heavy industrial purposes and electric power generation and save petroleum for "superior" uses?

The phrase "inferior uses" is both arbitrary and misleading. A New England textile manufacturer using oil for heat and power would hardly agree that his consumption of fuel represents an "inferior use." To him, oil as an energy source is not only important but downright vital. And to him, how he makes his living is certainly not an "inferior" endeavor. It is his whole economic life, probably. What's more, a switch from the fuel of his choice to a fuel the Government may dictate could mean a very expensive conversion that cuts deeply into his profits. He might not be able to operate efficiently if his fuel use were controlled by Federal decree.

The coal industry's suggestion sounds reasonable in its way, but a closer look reveals its sophistry. Although demand for petroleum hydrocarbons has more than doubled in the past 15 years, recoverable reserves of petroleum and natural gas are at an all-time peak. Based on past exploration and discovery experience, there is every reason to believe that oil and gas will continue to be in sufficient quantity for years to come, as long as the economic incentives of a free market are not impaired by artificial controls.

Consumption of coal on the other hand has declined from 1945 levels as a result of conversion to oil and gas for railroad fuel, domestic and commercial heating, and general industrial consumption. Efficient and more convenient equipment as well as ease of handling have been prime factors in converting from coal in these markets. Despite this loss of market, however, the outlook for coal demand is promising in view of the more than 50 per cent increase anticipated in demand for energy fuels over the next 15 years. Increasing demand for coal in power generation as well as in coking requirements in the steel industry is expected to make up for the past losses incurred in other marketing areas.

Despite its serious reservations about the desirability of a study considering a departure from free consumer choice, Texaco will cooperate in any impartial, objective study of this country's fuel resources that Congress or the Executive branch of the Government may see fit to undertake. The Company is fully confident that the results of an unbiased review will show once again that fuel oil and natural gas offer the American consumer the greatest energy bargains available in the world today, and that the best policy for fuels or anything else is the one America has grown on—the policy of free enterprise. •


URSA
TEXACO

At the start of a trip from Port Arthur, Texas, to Marrero, Louisiana, the Texaco tug Ursa, left, *moves into position at the stern of a Company barge.* Below, *the tug's captain pilots the barge train out of Texaco Island terminal at Port Arthur. The train will take five days for the round trip.*

BARGING TO MARRERO

ONE OF THE FIRST THINGS Texaco bought when the Company started in business 59 years ago was a barge, to move oil from the Company's Port Arthur, Texas, refinery site to a storage depot near New Orleans. *Texas Barge No. 1* is long gone—but the Port Arthur-New Orleans run still is important and barges still make it. For domestic deliveries, the barge remains a very important and efficient unit of Texaco's marine equipment.

As a matter of fact, nearly 40 per cent of the Company's domestic waterborne deliveries last year moved over inland waterways, which almost always means by barge (small tankers are used on the Great Lakes). In the United States there are areas very largely dependent on barge transport for their supply of Texaco products, and an inland waterways system of nearly 29,000 miles laces the country to serve those and other areas.

Over 60 million barrels of Texaco crude oil and petroleum products move through these inland waterways yearly, and about 10 million are carried on the Gulf Intracoastal Waterway. This is the route taken by Texaco barges making the Port Arthur-New Orleans trip.

Largest share of the Company's barge operations is in the Northeast—the upper Hudson River, New York State

Texaco Barges 799 *and* 800, *being loaded at far left, were put into service just last year.* Above, *the* Ursa's *engine room is checked before tow gets under way.* Left, *provisions are put aboard. Barge train's crew drinks over three gallons of coffee every day.*

Inland waterway distribution is an important adjunct to Texaco's other supply systems

Barge Canal, and the New England, New York City, and Philadelphia areas. Close behind, in volume of traffic, are movements from Mount Vernon, Indiana, and on the Gulf Intracoastal Waterway.

From one barge making one run, Texaco's inland waterways fleet and its responsibilities have developed impressively over the years. Twenty-two Company-owned barges and nine Texaco tugs that work mostly with the barges now are kept busy, along with a great many chartered vessels.

Barge traffic today originates from such scattered points as Albany, Norfolk, Los Angeles, Seattle, Savannah, and Mobile. Some runs are made along the great rivers of America: the Hudson, the Mississippi, the Ohio. Others take Texaco crews over canals so narrow in places, a crewman can almost reach out and touch either bank from the deck.

The Gulf Intracoastal Waterway is neither uniquely broad nor narrow. It *is* particularly colorful, and it is the one photographer David Forbert chose recently when he was assigned to picture a typical Texaco barge trip.

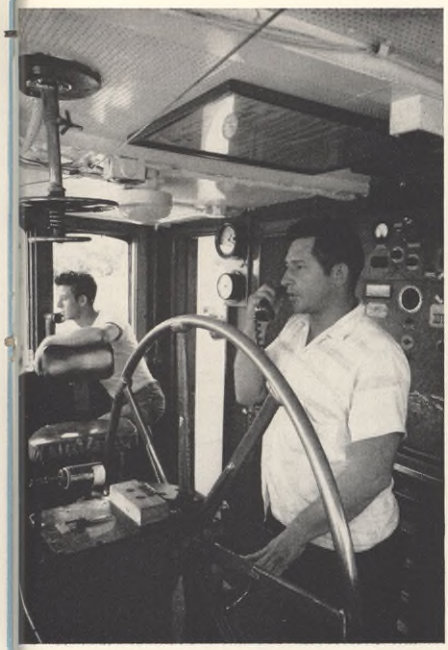
For a typical run from the Texaco Island terminal in Port Arthur to the Marrero depot near New Orleans, mixed cargoes of Texaco Fire Chief and Sky Chief gasolines and Texaco Diesel Fuel are pumped into the holds of two barges simultaneously at Port Arthur. Each barge has a capacity of 19,000 barrels.

While the loading goes on, and it takes several hours, samples of cargo are drawn periodically from the barges' tank compartments. The samplings are taken to a Company laboratory nearby where they are tested to make sure of absolute purity and all the other quality considerations Texaco insists on. This is a double check, really, because quality control is a major concern at all Texaco refineries. When a Texaco cargo shoves off from Port Arthur, or from any place else, it is right.

When the barges are loaded, they are lashed together in tandem by steel cables. Full barges are tremendously heavy (a load of gasoline weighs nearly 2,500 tons), and they would be uncontrollable if they weren't snug to each other. If they weren't tightly lashed, they would tend to elbow like highway trailers being backed up.

When the barges have been secured to each other, the tug moves into position at the stern of the trailing barge and itself is lashed to that vessel. Now the three are one long marine train, ready to move out.

CONTINUED

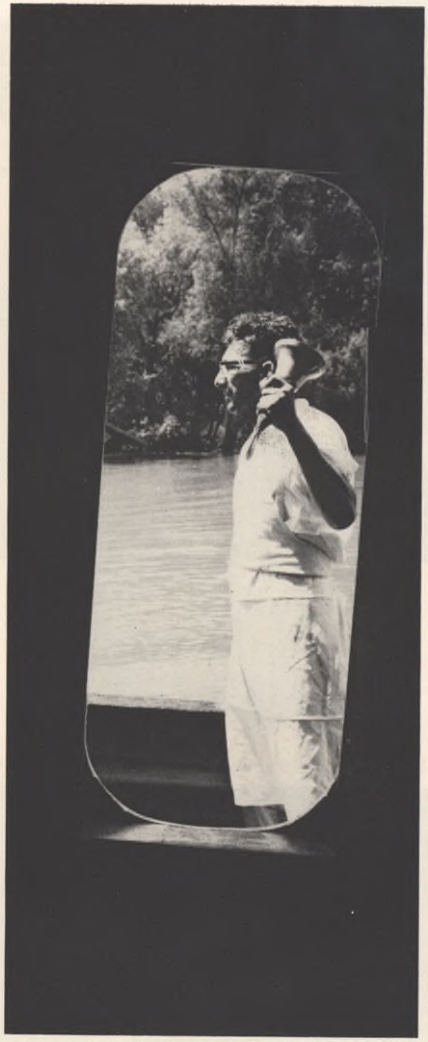


Along the way, left, *the Texaco tug keeps in constant touch with other river traffic using two-way radio.* Below, *a member of* Ursa's *crew stows gear; another crewman,* right, *busies himself with one of the seaman's traditional chores: splicing lines.*

On the first night out, tug and barges go through Vermilion locks, about halfway to Marrero.

The cook takes the sun while he peels potatoes.

A good ship has always meant plenty of good food.



Ashore or afloat, the clang of the dinnerbell is welcome.

Deep in bayou country, kids gather on

The trip from Port Arthur to Marrero takes about two-and-a-half days, and during it the tug keeps constantly in touch by two-way radio with other vessels on the canal. Tug captains and mates carry on running conversations from ship to ship: "Where are you now? . . . How much you towing? . . . When do you figure you'll make the bend?"

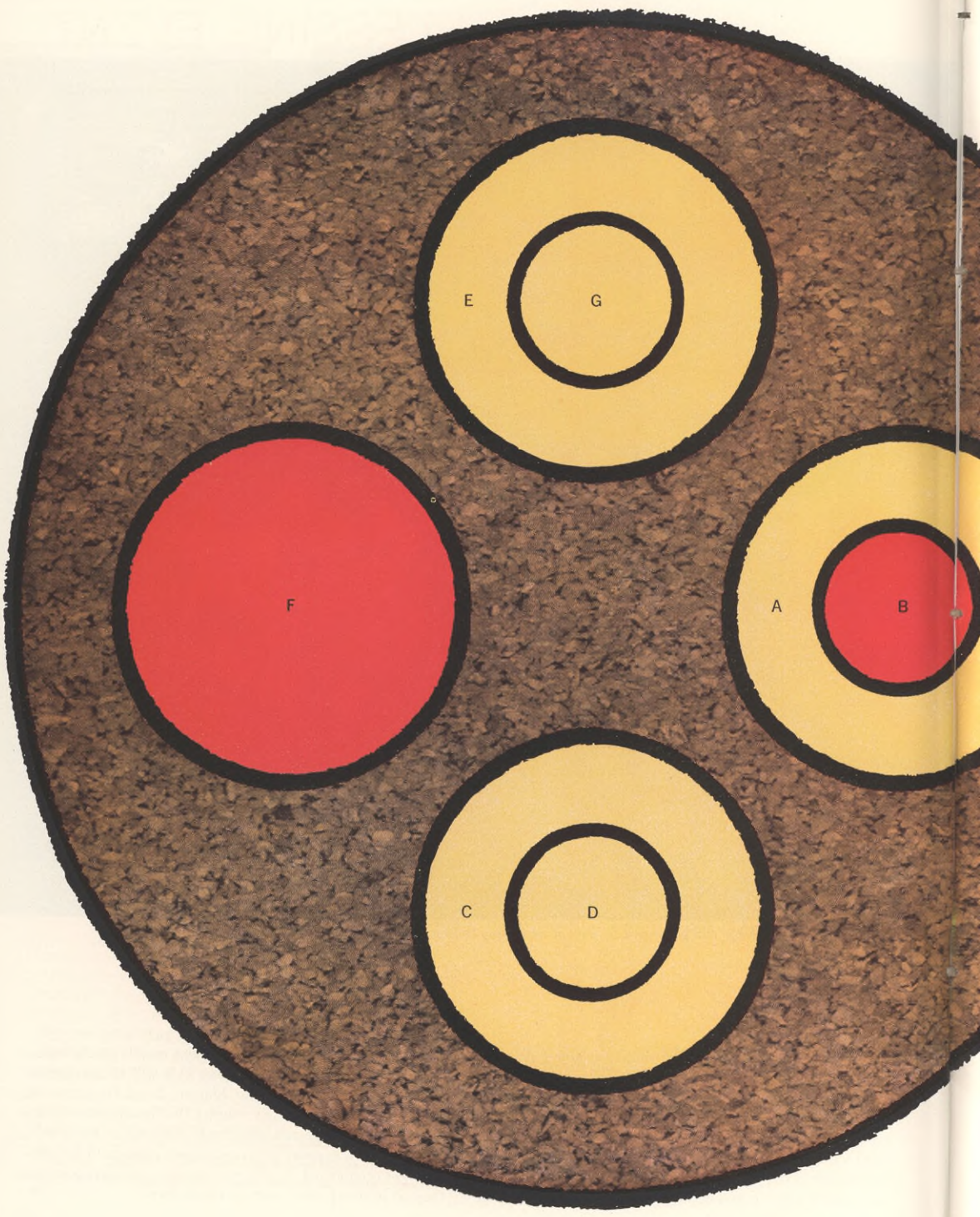
The idea, of course, is to avoid meeting at bends. Although an experienced tug pilot can, when he has to, swing a train of barges along a river with surprising deftness, jockeying 800 feet of barges into passing position at a tight bend in a canal is something he tries to avoid.

The tug ordinarily carries a crew of seven, each of the barges has a bargeman assigned to it, and the nine men keep busy during the trip the way sailors always have: standing watch, checking navigation charts, keeping the brightwork shining and the engine room shipshape.

the canal bank to watch the barge tow pass—and to wave it on its way to Marrero.

Generally, in other words, the routine is about the same as it is for any sailor. There is one difference that makes the Port Arthur-New Orleans trip as much like a railroader's as a mariner's, however: every so often along the way the crew will pass a tiny settlement of trappers or fishermen, its front yards edging on the canal. The tow's approach brings all the kids in the village, scrambling and shouting, down to the water's edge, everyone waves, and the Texaco barge slides by—like a freight rolling through a remote prairie town.

There is every reason to expect kids will be waving to Texaco barges on the run to Marrero for a long time to come. After 60 years, in an industry that has known almost unbelievable change and growth and often led in the development of new transportation techniques, barges still provide the most economical, flexible way to move products here, as they do in many other parts of the country. •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BLESSING EVENT

WHAT LOOKS LIKE a plate full of fried eggs at the left isn't. It is a highly stylized version of a record-making oil well. Texaco drilled the well and made the record.

In the illustration, you are standing on a drilling derrick floor looking straight down more than 8,500 feet. You are looking at a protective casing (the drawing is actual size) through which four strings of slim-hole casing have been set and cemented in a 9⅞-inch bore hole. You are looking at the first septuple well completion in oil history.

The well is some 70 miles southwest of Houston, near Blessing, Texas, in a producing area that contains seven different oil- or gas-bearing sands. One of these is just two feet thick, and several others are only four feet. To drill seven wells into such shallow sands could easily cost more than the oil or gas recoverable from them would pay for. On the other hand, not to drill would mean leaving petroleum in the ground, wasted.

This was the dilemma Texaco faced recently in the Blessing field, and the Company's solution established a world's record. Instead of drilling seven separate wells, Texaco drilled one—but sank seven individual strings of casing and tubing to the seven different levels through one main casing. Since August, it has been producing from seven strata through one bore hole.

Although multiple completions are not brand-new, never before had a seven-level well been completed. What Texaco did at Blessing did not break entirely new ground in multiple completion work; but it was a quietly important accomplishment on a scale never before attempted successfully.

Sending a string of slim-hole casing less than three inches in diameter thousands of feet into the earth to probe a layer of producing sand just two feet thick is quite a feat in itself. Producing men take it pretty much for granted these days; they do it often, and they have very sensitive scientific equipment helping them. However, without a tremendous amount of production research, like that conducted by Texaco's Bellaire, Texas, Laboratories, what is now commonplace would be impossible.

Another tricky maneuver carried out in completing the Blessing well involved the perforations of the different casings, when they had reached the right depths, to allow oil or gas to flow into them. The bottom sections of casing are perforated underground with gun-like devices detonated electrically from the derrick floor. The perforating gun is controlled by an orienting device that directs explosive charges into producing sands and away from other casings in the same hole. Oil and gas find their way into the casings through the channels that these underground explosions create.

Ordinarily, of course, there is only one flow-string of pipe sunk to one depth. In the Blessing well there are seven, sunk to different levels, inches apart. Seven flow passages are created by four strings of slim-hole casing, three of which contain additional inch-and-a-quarter strings of tubing. Three of the flow passages are provided through the three inch-and-a-quarter strings; three more are provided through the areas between the inner strings of tubing and the outer slim-hole casings; and the seventh flow passage is provided through the remaining string of casing.

Technical problems, interesting as they were, were not the most important part of the Blessing completion by any means. Most important was the concept—to multi-complete a well in a different and less expensive way rather than abandon reserves that ordinarily would be uneconomical to go after. ■

Admiral Arleigh Burke

George Parker, Jr.

TWO NEW DIRECTORS ELECTED TO BOARD

During the last quarter of 1961, two men were added to Texaco's Board of Directors. The first brings to the Company a distinguished record of executive skill in the United States Navy; the other will contribute importantly to the Board's activities from his broad knowledge of both the investment and oil businesses.

On October 27, Board Chairman and Chief Executive Officer Augustus C. Long announced the election of Admiral Arleigh Burke, U. S. Navy (Ret.), as a member of the Board of Directors and of the Executive Committee of the Company.

Arleigh Burke, who retired as Chief of Naval Operations on August 1, 1961, after 42 years of service in the Navy, was graduated from the United States Naval Academy in Annapolis in June, 1923.

During World War II, Admiral Burke commanded several Destroyer Divisions, and because he pushed his ships just under boiler-bursting speed he became widely known as "31-Knot Burke."

At the outbreak of the Korean War, he was ordered to duty as Deputy Chief of Staff to Commander Naval Forces, Far East. In July, 1951, he was made a member of the United Nations Truce Delegation to negotiate with the Communists for a military armistice in Korea. Six months later he returned to the Office of Chief of Naval Operations where he served as Director of Strategic Plans Division until 1954.

In August, 1955, he was named Chief of Naval Operations and member of the Joint Chiefs of Staff. In serving three terms as CNO, he served longer as a Chief of Service than any other officer in the history of the United States.

Admiral Burke has received numerous awards including the Distinguished Service Medal, the Navy Cross, the Legion of Merit, the Purple Heart, and a great many foreign decorations.

The election of George Parker, Jr., as a Director of the Company was announced on December 27.

Mr. Parker is associated with his father, George Parker, Sr., in investment activities in San Antonio, Texas, and is a partner in the Lewis Oil Company, the Parker Oil and Gas Company, and other firms in the oil and gas industry. He also engages in ranching in the U.S. and Canada.

After graduating from Princeton University with a B.A. degree in 1943, Mr. Parker served in the United States Navy as a Lieutenant (jg) until 1946. Following receipt of an LL. B. degree from the University of Michigan Law School in 1949, he did graduate work in law at Southern Methodist University.

Mr. Parker practiced law in Dallas from 1949 to 1957, when he became associated with his father's business interests. He is a member of the Texas Bar Association, the American Bar Association, and the Southwest Legal Foundation at San Antonio. He is a Fellow of the J. P. Morgan Library of New York City and a member of various civic organizations in San Antonio and Dallas.

EXECUTIVE CHANGES ARE ANNOUNCED

Five important changes in executive responsibilities became effective on November 1.

Archie W. Baucum and Marion J. Epley, Jr., were elected to the newly created positions of Executive Vice President. John W. Green, Vice President, Domestic Sales, was elected Senior Vice President in charge of world-wide marketing, succeeding Mr. Epley.

Homer O. Woodruff, General Manager, Domestic Producing, succeeded Mr. Baucum as Vice President in charge of the department. John I. Mingay, General Manager, Domestic Sales, succeeded Mr. Green as Vice President and General Manager of the department.

Mr. Baucum joined Texaco in 1934 and held increasingly important positions in the Domestic Producing Department until 1954, when he was named Assistant to the President. He was appointed General Manager of the Foreign Operations Department (Western Hemisphere and West Africa) in 1956, and in 1957 became General Manager of the Foreign Producing Department (Western Hemisphere and West Africa). He was elected Vice President in charge of the Domestic Producing Department in 1958.

Mr. Epley became associated with Texaco as an Attorney at New Or-

Archie W. Baucum

Marion J. Epley, Jr.

John W. Green

Homer O. Woodruff

John I. Mingay

leans in 1947. Following promotions to various positions in the Legal Department in Louisiana, he was transferred in 1952 to New York, where he served as General Attorney. He became Assistant to the Chairman of the Board in February, 1958, and was elected Vice President late that year. He was elected Senior Vice President in charge of world-wide marketing in 1960.

Mr. Green joined Texaco's Domestic Sales Department at Dallas in 1935. After serving as State Manager for Georgia and as Division Sales Manager at Houston, he was made Manager of the Company's 11-state Southern Sales Region in 1956. In 1958 Mr. Green came to New York as Manager of the 11-state Northern Sales Region. He was appointed Assistant General Sales Manager in 1959 and was elected Vice President in charge of Domestic Sales in 1960.

Mr. Woodruff joined Texaco in 1933 in California and served in producing operations there, becoming Assistant Division Manager at Los Angeles in 1949. In 1956 he was promoted to Assistant General Manager of Domestic Producing at Houston, and in 1958 to Division Manager at Tulsa. In 1959 he was appointed Assistant to the Vice President in charge of the department, and in 1960 was made General Manager.

Mr. Mingay joined the Domestic Sales Department at Indianapolis in 1937. After holding important sales positions in Cincinnati, Evansville, and Cleveland, he was transferred to New York in 1951 as Assistant to Management in the Marine Department. The following year he became Manager of the Operations Division, and in 1956 was promoted to Assistant General Manager of the department. In 1960 he was named General Manager of Domestic Sales.

NEW REFINING FACILITIES PLANNED

Construction of two important new processing facilities will add to Texaco's manufacturing capabilities within the next three years. The first, a 13,500 barrel-a-day refinery, is scheduled to be built at Eastern Passage near Dartmouth, Nova Scotia, and is expected to go on stream in mid-1963. The second, a lubricating oil plant with a capacity of 2,700 barrels a day, will be built at Pointe-à-Pierre, Trinidad. Construction of this plant is expected to be started early in 1962 and completed in 1964.

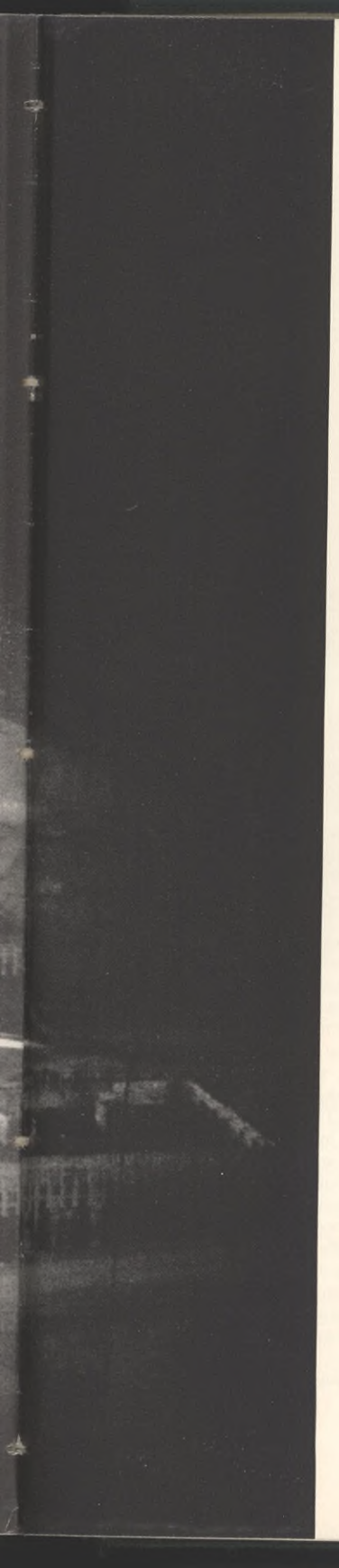
The Nova Scotia refinery, which will be operated by Texaco Canada Limited, is being built to meet Texaco's growing product requirements in New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland, and the lower St. Lawrence region of Quebec. Cost of its construction is placed at about $14 million.

The refinery will represent further tangible proof of the Company's confidence in the continued growth and development of Canada's Atlantic provinces—an area in which Texaco Canada Limited has been very active since establishing its Atlantic Division two years ago. In that period, it began marketing in Newfoundland for the first time and has expanded its marine terminals at Saint John and Chatham, New Brunswick; built new terminals at Charlottetown on Prince Edward Island, at Long Pond Manuels, Newfoundland, and at Eastern Passage. One of the largest integrated oil companies in Canada, Texaco Canada Limited already has three refineries—one near Montreal, another at Port Credit, and the third at Edmonton.

Lubricating oil stocks made at the new Pointe-à-Pierre plant, which will be one of Texaco's largest foreign installations of its type, will be shipped in bulk to Texaco's foreign markets for blending and compounding (see "Trinidad: A Five-Year Report," beginning on Page 3). Blending and packaging facilities will also be included in the plant in order to provide finished motor oils for the West Indies and Caribbean markets.

Construction of the Trinidad plant will cost an estimated $27 million and will provide employment for some 1,000 Trinidadians. Training programs to prepare workers for the construction phases will be started by Texaco Trinidad, Inc., which is one of the island's principal employers. When in operation, the plant will employ some 200 people.

The new plant will be adjacent to Texaco's 235,000 barrel-a-day refinery at Pointe-à-Pierre. The Pointe-à-Pierre refinery, which ranks as one of the world's largest, was expanded to its present capacity as the result of a $21 million project completed by the Company in October, 1960.



Putting a river to work

IN THE PHOTOGRAPH at the left, you are looking across the base of the half-completed Greers Ferry dam, which in 1964 will be opened to become key control point for an ambitious new flood control system in northeast Arkansas. Building the Greers dam has meant a prodigious earth-moving and construction effort. It has also meant the use of enormous amounts of petroleum products. So far, all of those products have been Texaco's.

When the dam is in operation it will generate 96,000 kilowatts of electricity to serve industrial and home users in the area. Incidentally, but importantly, it will create a lake almost 50 miles long that the public will be able to use. Availability of hydroelectric power and the potential for a big new resort and tourist industry are naturally pleasant prospects to civic planners throughout the area the dam will serve. Their communities could see a dynamic new era of economic growth.

The completed dam, 1,704 feet long across the top, will rise almost 250 feet above the bed of the Little Red River at Heber Springs—about 87 miles northeast of Little Rock.

To clear and prepare the site for such a structure takes a great deal of heavy equipment, most of it on wheels, and the supplying of sand and gravel for concrete (the dam will use 850,000 cubic yards) means a lot of hauling. The amounts of lubricants and fuels being used make statistics that in their way are as impressive as those describing the dam itself. One task force of 21 of the huge scrapers, earth movers, and tractors gulps down an average of 3,000 gallons of diesel fuel a day. Dam work is big work, and supplying the petroleum products for the Greers Ferry dam has been a big job for Texaco. •

LUBRICATION OUT OF THIS WORLD

Space travel has created a whole new set of problems for the oil industry to solve

For an automobile, a 2,000-mile oil drain is imperative. For most space craft, it is impossible—and if that sounds as though space flight eliminates one lubrication problem earthbound travelers must contend with, it patently does not. It just creates one of many the oil industry is trying to solve as we move toward the time a trip into space no longer makes newspaper headlines.

The precision controls and the extremely sensitive instrumentation used in vehicles for space flight, and many of the devices for exploring space and other planets, obviously will require lubrication. No matter *where* one is, machinery just does not function properly unless it is properly lubricated; and in the vast blackness of outer space, performance requirements are particularly critical.

But space presents a hostile environment for the familiar lubricants and lubrication techniques that have been developed over the years to perform on earth, and in the comparatively low altitudes above the earth we use now for air travel. Space is another realm that only recently have we learned to discuss knowledgeably. Either the lubricants we now have must be protected from the hostile environment of space, or new materials and processes must be developed.

Protection will be automatic in some cases—when lubricants are used in passenger compartments with an earth-type atmosphere, for instance. But there will be other applications outside the passenger areas where it is not possible to provide any protection, where lubrication will have to be performed in the space environment. To seal equipment hermetically and in that way maintain an earth atmosphere for lubricants is feasible, but hermetic sealing creates problems of its own: the sealing itself, increased complexity, weight, maintenance, and reliability.

What in the space environment is so unfriendly to conventional lubricants? Essentially, the absence of air, atmospheric pressure, and gravity; but also extremes of temperature and cosmic radiation not found on earth.

Although most motorists probably have never thought of air as important to the lubrication process, it is. Some lubrication applications depend on air to help form chemical oxide films that serve to reduce friction and wear resulting from metal-to-metal contact in gears and bearings. So the absence of air in space may require new ways to prevent metal-to-metal contact and to keep friction at low levels.

Atmospheric pressure has a decided influence on lubricants, too. All materials tend to evaporate to some degree, and the lower the atmospheric pressure the greater the tendency to vaporize. In space, atmospheric pressure is zero for all practical purposes (space is a nearly perfect vacuum), and conventional lubricants evaporate quickly. Because of this, lubrication in space requires lubricants that stoutly resist evaporation.

The space environment does not just break our laws of gravity. It never heard of them. What goes up, in space, doesn't come down on its own, and this creates another set of problems for the industry to solve in connection with space-age lubrication.

On earth, gravity is put to work. It is taken into account in directing lubricants to, and keeping them in contact with, parts that need lubrication. In gravity-free space, where men bound hundreds of feet simply by taking a step, lubricants are just as weightless. They tend to float around in containers and lubrication systems, posing a whole set of handling-control problems.

Temperatures in space vary almost unbelievably. On the moon they range all the way from −150° F or lower to +250° F or higher, and in other places the variation is even more extreme. Temperature-control for space vehicle interiors has been largely solved, but ships re-entering the earth's atmosphere generate surface temperatures of many hundreds, or even thousands, of degrees because of aerodynamic friction heating. What's more, some lubricants may have to operate near rocket engine fuels and oxidizers like liquid oxygen or liquid hydrogen whose temperatures range from −297° F to −423° F.

Cosmic radiation of the types and amounts now known to exist in space will not be severely damaging to conventional lubricants. However, the possibility of damaging radiation, which can cause greases to harden, to turn rubbery, or turn to fluid, to thicken or otherwise change, is another problem petroleum scientists must keep in mind and guard against in the event more serious radiation bombardments are suffered in space—or lubricants are located in unprotected areas near nuclear power sources aboard vehicles. (For a graphic demonstration of the effect radiation can have on greases, see the inside front cover of the Summer, 1961, Star.)

It seems clear that new, or at least different, lubricating methods will be needed in certain space applications, and the industry is looking into several possibilities.

Special low-volatility mineral oils and synthetic oils, gases, liquid and gaseous fuels, liquid metals, and a number of other materials have been proposed and are being studied. "Dry film" lubricants are receiving interested attention, too. These are coated on metal parts; they include metal oxides, metal salts, soft metals, graphite, molybdenum disulfide, resinous plastic compounds, ceramics, and different combinations of such materials. The intriguing idea of preventing metal-to-metal contact by suspending rotating parts in electromagnetic fields is another scientists are looking into.

Most likely, no one "lubricant" or means of application will turn up as the ultimate solution. More likely, several materials and several processes will be used to arrive at the best solutions to the different space-lubrication problems. Meantime, work in the general field of lubrication for space flight has so far been hampered by the great difficulty of duplicating the space environment on earth. The unearthly space conditions of vacuum and gravity have been particularly hard to match.

Aside from the formidable environment they must expect

lubricants to meet in space, oil scientists face problems right here on earth in their work with space-age lubricants.

In military missiles particularly, lubricants must be very stable in storage over long periods—so the missile will be ready for launching without delay and no failure will occur because lubricants have deteriorated during storage. In the case of ballistic missiles launched from earth and destined for another part of earth, flight time is short and many conventional lubricants can survive long enough in the arc through space to complete the missile's mission.

On the other hand, certain satellite and space-vehicle missions mean several months of flight. They require long lubricant service periods without further attention. Then too, stress is put on lubricants by the crushing accelerations at blastoff, and by the heavy vibrations from rocket engines.

Finally, the precise construction and design of space equipment make it inherently sensitive to lubricant cleanliness. Very small particles of contaminants can cause malfunctioning, jeopardizing the safety of the entire vehicle. Special care to keep lubricants free of contaminants is mandatory. In any space application, reliability is absolutely vital.

These are a few of the space-age lubrication problems the industry faces, and is examining with urgency. Their solutions will take original thinking, thorough development work, and scrupulous testing.

Against this background of industry effort, Texaco—whose research facilities are among the most advanced anywhere—is sure to emerge as an important contributor. •

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