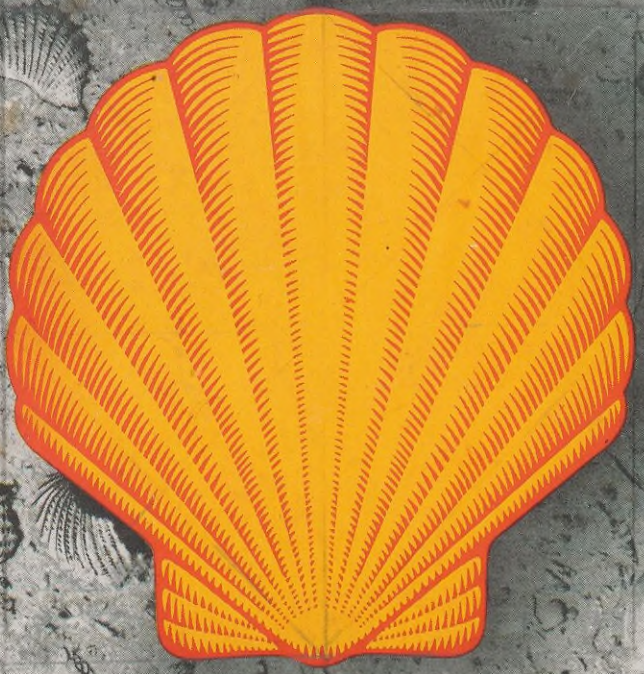
APRIL 1951

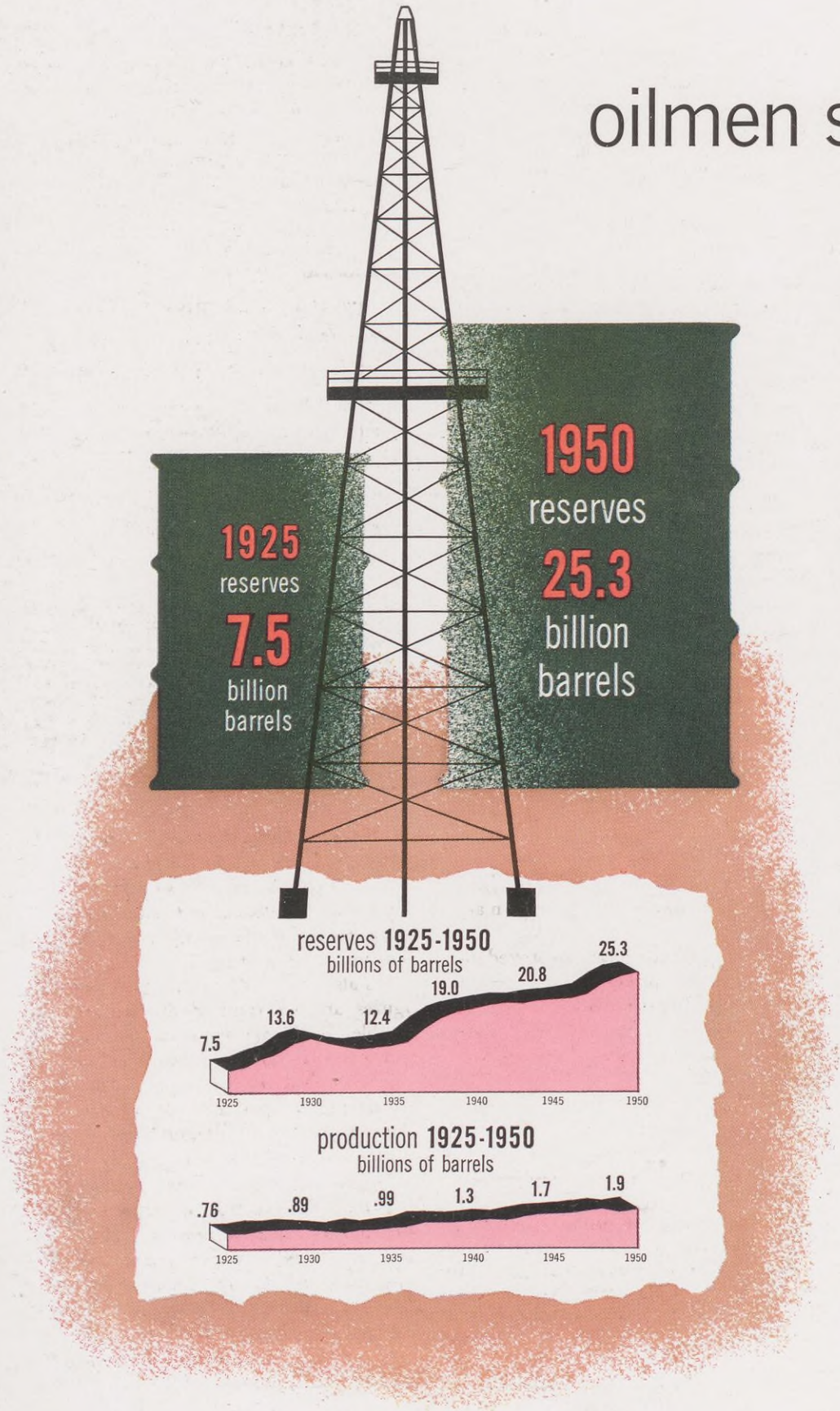


SHELL NEWS

REVIEW OF 1950

oilmen speed search f

By H. S. M. BURNS



THE current mobilization program has given the oil industry the biggest peacetime job in its career—to stretch supplies farther than they ever have been stretched before.

It means stepping up every phase of our operations, from oil field to consumer. It means finding new fields, drilling more wells, speeding up transportation, boosting refinery output, expanding distribution facilities.

In 1925, America's reserves of crude oil were estimated at a little over seven billion barrels (each oil barrel equals 42 gallons) and some said we were running out. Since then, we have produced about 33 billion barrels.

Yet America's proved reserves stand today at more than 25 billion barrels. We aren't running out very fast!

That sounds like a lot of oil—and it is—but at the present rate of consumption it would only last 10 years. So the oil industry must keep up the search for more oil—and find it.

Easier said than done. As time goes on, oil becomes harder and harder to find. The more easily discovered fields have long since been found and drawn upon. To get new reserves, we must go farther afield, drive wells deeper, even look beneath the seas.

Shell has made one of its most interesting searches under the Gulf of Mexico. Ships fitted with Shoran—a specialized type of radar—worked as far as 30 miles offshore, far beyond the sight of land, the Shoran acting as the marine equivalent of the land surveyor's transit-and-rod. With this electronic position-finder, under-water geophysical studies can be made about 50 times faster than formerly.

SHELL NEWS

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Dedicated to the principle that the interests of employees and employer are mutual and inseparable

Employee Publications Department
New York, N. Y.

contents

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for new reserves

We believe that the most fundamental contributions will come from our new laboratory in Houston, where the most complex equipment and techniques, including radioactivity, are used to discover new and better methods of finding oil and getting it out of the ground.

For oil buried two or three miles below the surface—even if we know where it is—will not fuel a plane or heat a home. Not only must oil be found but it must be produced without waste and in such a way that the greatest possible amount will be recovered from the oil-bearing formations. That's what oil men mean when they talk about conservation.

One of the biggest conservation jobs ever attempted is now under way at Benton, Ill. Here, Shell is pumping water into a nearly-exhausted oil field in order to get more oil out. The job is tricky because the oil field, although only 2,100 feet below the surface, lies under one of the largest coal mines in the world.

In a field of this type, after many years of production the pressure that moves the oil from the formation declines and the flow into the wells becomes slower and slower. The injected water fills the space voided by the oil already produced and flushes the oil into the producing wells. The job is paying off spectacularly already. Production of the field had fallen to 700 barrels per day when water-flooding began; today, it is producing over 4,000 barrels per day and still going up.

Another aspect of conservation arises from the need to make the best of every drop of oil we produce. Much of the gas that accompanies oil to the surface contains vapors that can be converted to valuable liquid products. Special plants at the field act as "wringers" to separate these products; in some cases the remaining "dry" gas is pumped back underground to rebuild pressure and prolong the life of the field.

If conservation is a watchword in oil fields, it is practically a religion in oil refineries. Many oil men can remember when you could count on your fingers the number of products made from crude oil. Now we make about 1,200.

What's more, we have improved the yields of the products most in demand. In 1918 we could convert 25 per cent of the average barrel of crude oil into gasoline. Today the yield is 43 per cent.

It's a good thing the yield has been raised. The demand for gasoline has become so great that if we still depended on the 25 per cent cut, there would not be nearly enough crude, or gasoline, to go around.

It's also a good thing that the yield figures are not rigid. Refineries are flexible. They can make more gasoline and less heating oil, or less gasoline and more fuel for jet engines. They are geared to give the best possible yield of any desired product from any quantity of crude that is fed into them.

Thanks to these and other methods of stretching existing oil supplies—and thanks, also, to the 10 billion dollars' worth of new plants and equipment added by America's oil companies during the past five years—we have increased our ability to meet the nation's needs far above the level of World War II.

In recent weeks the Newspaper Enterprise Association, one of the largest news syndicates in the nation, approached a group of business leaders to find out how national mobilization has affected their operations. Speaking for the petroleum industry, H. S. M. Burns, President, Shell Oil Company, told what mobilization means to the oil business in the statement reprinted on these pages.

Exploration and Production

THE year 1950 saw a rising demand for crude oil stimulate exploration and production activities throughout the oil industry. This was in sharp contrast to 1949 when crude production easily exceeded demand.

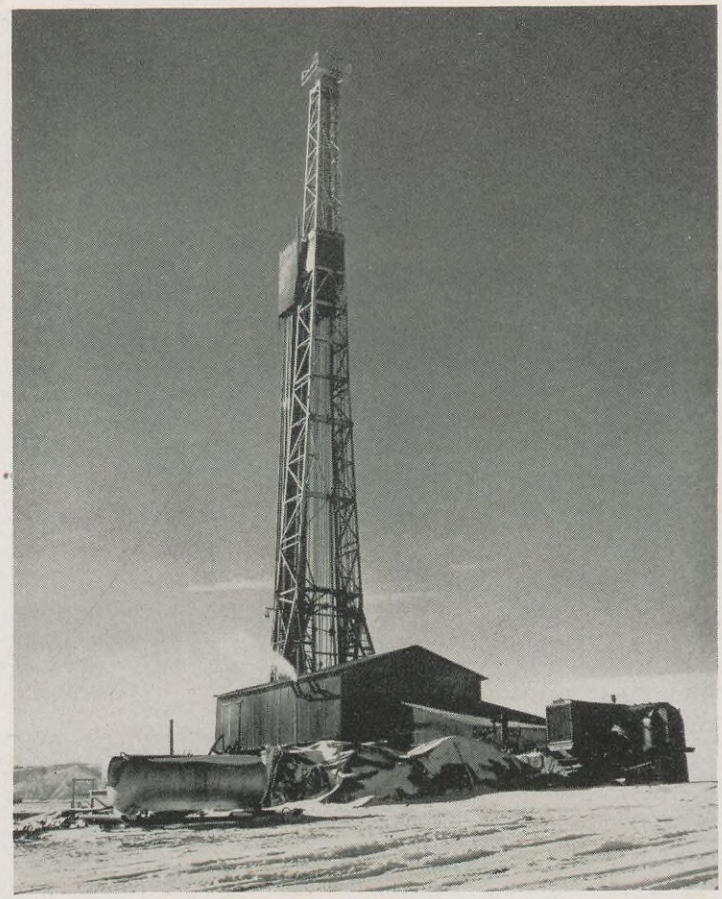
Shell's operations were a good example of 1950's increased activities. By the end of the year, the Company had produced 72,216,000 barrels of crude oil, up almost three per cent over the production of the previous year. Of the 393 new wells drilled during the year, 310 were completed as producing oil wells and 31 as producing gas wells.

The Search for Oil

There was intensive search and lease activity from Mexico to Canada, though offshore operations continued to be limited by the uncertainty of title to leases in Gulf waters. Some of the Shell exploration crews were busy in the intermontane basins of the Rocky Mountains. (A feature story of the March 1951 issue of SHELL NEWS described this activity in detail. In this connection, the Rocky Mountain Division has just announced an important new extension to the South Glenrock Field, 20 miles west of Casper, Wyoming. The well proving this extension which is Shell's first discovery in the Rocky Mountains, flowed 550 barrels a day of 35.4 degrees gravity oil.) Surface geological reconnaissance teams went into the Great Basin of eastern Nevada and western Utah where an exploration boom is in the making. Airborne magnetometer surveys were flown in to the Palo Duro Basin of southwestern Oklahoma and the Texas Panhandle and to the Williston Basin of Montana and the Dakotas.

The Williston Basin was again the scene of a tremendous leasing and exploration play as the industry sought to extend the rich producing region developing on the Canadian side of the international boundary. Shell seismic parties and geologists were actively engaged in the exploration of the more than 4 million acres held by the Company in this area.

New development techniques were demonstrated in the 1950 exploitation of the Big Foot Field in the Houston Area. Roustabouts and drilling crewmen are shown above laying down drill pipe preparatory to running casing into a Big Foot well.



Extensive exploration of the Rocky Mountain region throughout 1950 led to the recent completion of Shell's Government No. 1 Well, an important discovery in the South Glenrock Field, 20 miles west of Casper, Wyoming.

Hitherto neglected portions of some of the coastal basins of California shared the exploration spotlight. Intensive exploration of the southerly reaching arm of the rich Los Angeles Basin, for example, pushed the Company's lease holdings there to 90,000 acres. Included in the acreage is the famous Irvine Ranch which spreads from the Santa Ana Mountains to the sea.

It was, in addition, an unusual year for exploration drilling. Of 80 exploratory wells drilled during 1950, including those wholly or jointly owned, 46 produced oil and 6 gas. Though most of these discoveries are of doubtful commercial promise, some appear to be important finds even at this early date.

At North Antelope Hills in the southwestern part of California's San Joaquin Valley, an exploratory well came in flowing 500 barrels of oil a day from about 2,500 feet. By the end of the year, five producing wells had been completed in the area.

Important successes came along the Gulf Coast. Shell opened up the South Pass, Block 24 Field in offshore waters at the mouth of the Mississippi River, which now promises a very satisfactory reserve. Another discovery of significance was the Helen Gohlke Field in the Houston Area's Corpus Christi Division, the discovery well having an initial flowing potential of 320 barrels a day. A third Gulf Coast wildcat started the Burtville Field in East Baton Rouge Parish, Louisiana. The initial test, Gianelloni No. 1, was completed flowing at the rate of 309 barrels of 47.6 degree gravity oil per day.

In the Mount Hope area of Logan County, Northeast Colorado, a discovery well was brought in with a daily flowing potential of 300 barrels of oil from 4,885 feet. This wildcat was of particular significance to Shell in view of its extensive holdings in the Denver Basin area.

Development of Older Fields

A major extension was made at the Elk City, Oklahoma Field where Shell completed 71 development wells during the year and extended the length of the producing area by approximately two miles. Shell operates 88 gross wells of the 113 producing wells in the Field which now produces 18,000 barrels of crude oil a day, nearly three times its daily production of a year ago. As holder of a majority interest in the Field, Shell will undertake cycling and pressure maintenance for the Field as soon as the Elk City gas plant is completed and certain producing wells are converted to injection wells.

Other 1950 development operations uncovered sizable additions to Shell's crude oil reserves. The drilling of a semi-exploratory well in the North Drinkard Field in Lea County, New Mexico disclosed commercially productive zones in addition to those already being exploited. Extensions were also found in the Brunson Field in the same state and in the North Russell area of West Texas. Aggressive development work continued to extend production in several fields in the Ardmore Basin in southern Oklahoma.

Several extensions were made to the producing area of Weeks Island Field in Louisiana. The Weeks Gall State Unit No. 2, Well No. 2, completed in a new zone through perforations at 15,122 to 15,137 feet, is now the second deepest oil producing well in the country.

Early in 1950, Shell joined in the exploitation of fabulous Scurry County in West Texas by acquiring the Velma Thompson lease in the Sharon Ridge Pool. By the end of the year, 7 wells had been completed and an eighth was drilling. With another 160-acre tract also proved productive

Shell has already recovered more than 4 million barrels of oil from the rich young Elk City Field in western Oklahoma where the Company pursued widespread development operations during the year.

during the year, further development is planned at Scurry for 1951.

On the West Coast, the development of the northerly extension of the Ventura Avenue Field, begun in 1949, continued at a rapid pace and out-stepping wells were drilled in both easterly and westerly directions. Northerly extensions were also made at the east and west ends of the Brea Canyon Field and several flowing wells were completed. These are the first flowing wells for the Brea Canyon Field in many years and arise from Shell's having found new productive areas in the Field.

New development techniques were demonstrated in the 1950 exploitation of the Big Foot Field, a 1949 Houston Area discovery. Wells at this field were small and numerous—the 34 drilled in 1950 averaged 15 barrels of oil a day. Newly devised techniques reduced the drilling time for these 3,300 foot deep wells to 4-5 days, with the record for actual "rotating time" cut to 29 hours.

Secondary recovery activities increased during the year with the full scale operation of the Benton water flood and the start of flooding operations in the Cordes, Iron and Salem Fields of Illinois. At Benton, with approximately 10,500,000 barrels of water injected into the Tar Springs sandstone, today production has passed 4,000 barrels of oil daily and is still rising. This compares to the 730 barrels a day produced just prior to the commencement of flooding operations.

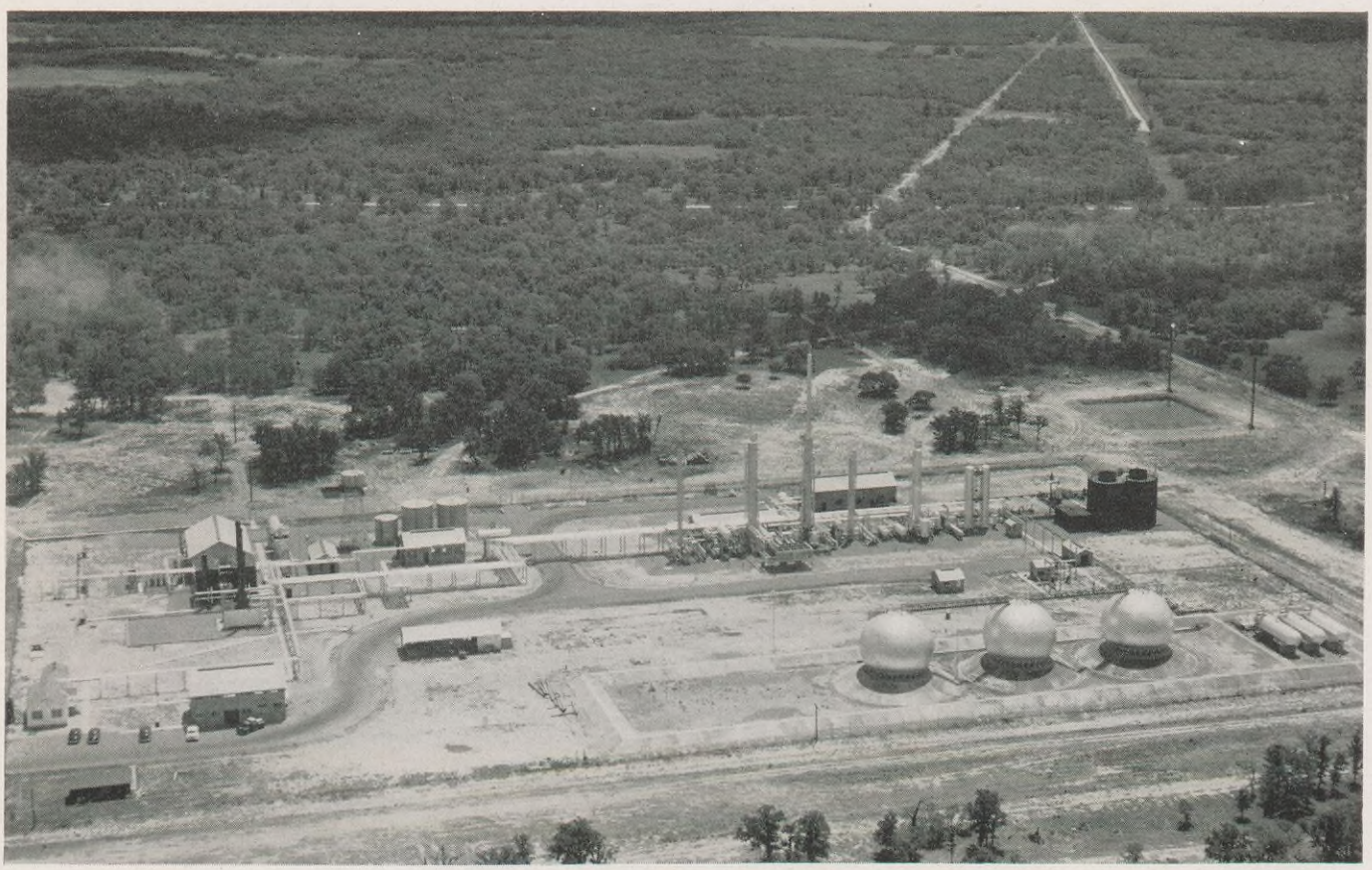
Put in operation in August 1950, the Cordes flood has already increased total production of the Shell-operated wells in the field from about 100 to 425 barrels of oil a day. There are 70 producing wells and 35 injection wells in the project. Shell began its operation of the Iron water flood on December 1, 1950 and injected 105,000 barrels during the month. This flood will ultimately include a total of 24 producing wells. In the Salem field, five of seven producing reservoirs will be flooded, with the Texas Company acting as operator. Although Shell has only a minor interest in this project, it represents an important reserve of oil.

New Gasoline Plants

The increasing importance of natural gasoline production was emphasized by new construction in 1950. In south Texas, the Provident City gas plant was completed to serve the Provident City, Brushy Creek, Hope and Englehart Fields. With a rated intake capacity of 60 million cubic feet of gas a day, the new plant will recover about 2,500 barrels of liquid products a day from the incoming wet gas, and provide 50 million cubic feet of residue gas for sale to the Texas Eastern Transmission Corporation.

Construction on the Elk City gas plant in western Oklahoma was begun early in the year, and though not yet completed, the new plant was placed in partial operation in January 1951. Processing all gas and liquid direct from the wells, this plant is designed to handle 100 million cubic feet of gas and 20,000 barrels of high gravity crude oil a day. In addition to extracting volatile products from the gas, the Elk City plant will stabilize the incoming crude and compress up to 75 million cubic feet of gas for reinjection into the reservoir in repressuring operations.

For reasons of efficiency and economy, interest in four old and comparatively small gasoline plants was discontinued in 1950. In the Texas Panhandle, Bryan No. 2 plant was shut down, and gas formerly processed in this plant will be handled by the Bryan No. 17 plant. Three



∨ Other development activities took place at the Ventura Field in California, Shell's largest Pacific Coast crude oil reserve.

∧ Placed in full operation toward the end of 1950, the Provident City gas plant serves Shell oil and gas fields in south Texas.

∨ Using water from Lake Moses, repressuring operations substantially boosted production at the Benton Field in Illinois.

others were discontinued in northern Oklahoma. The Osage plant which had been in operation since 1916 was shut down and its equipment will be salvaged during 1951. Operation of the Tonkawa plant was assumed by the Continental Oil Company and the Lucien plant was farmed out for operation by another company. The majority of the operating personnel from these four plants have been transferred to the Elk City plant.

A gas collecting pipe line, some 6 miles in length and ranging from 8 to 10 inches in diameter was laid by Shell from the Ten Section Field absorption plant to the Paloma Field in California. This line collected some 32 million cubic feet of wet gas produced by operators in this field and processed by Shell in its plant in the Ten Section Field.

In order to treat this additional gas, absorption plant facilities had to be enlarged and a "fat oil" deethanizer installed. The plant now processes 60 million cubic feet of wet gas per day, 32 million of which comes from the Paloma Field.

Two different types of trial automatic tank battery installations were developed in the Midland Area. One system uses electrically actuated controls to record tank gauges, sample oil runs and control well production. The other, using pneumatically-operated controls, weighs the oil produced as a means of determining its volume. Work is continuing on both systems. If either proves successful, crude oil may be automatically measured at the well and moved directly from the well to the pipe line. Such a system would reduce the need for field storage and speed production measurements.

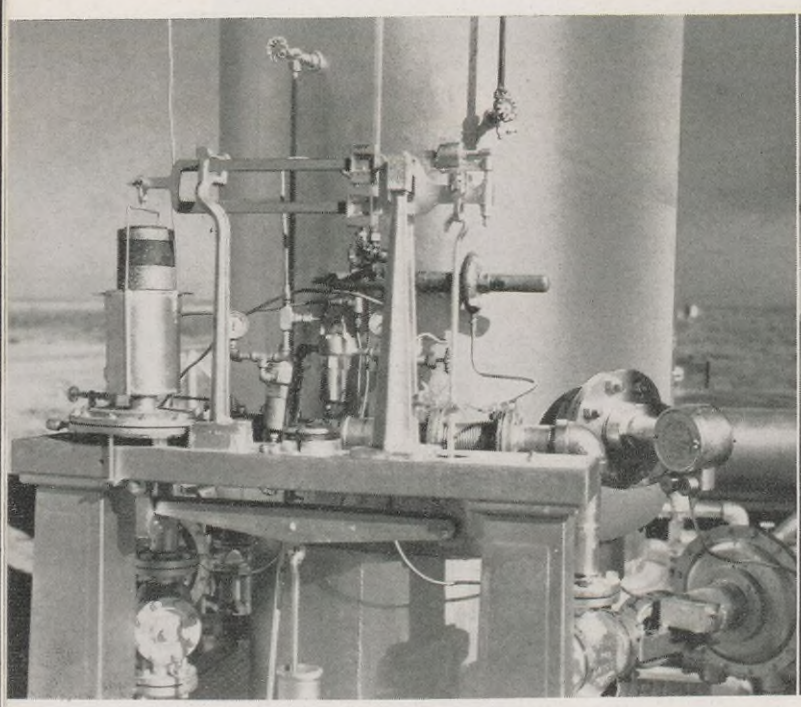
The modernization of production facilities on the Bowen lease in the McCamey Field in Crane County, Texas was concluded during the year. Exploitation and mechanical engineers collaborated on this project in deepening individual wells and installing individual electric pumping units. Lease production capacity increased from 770 to 1,350 barrels a day as a result.

Research

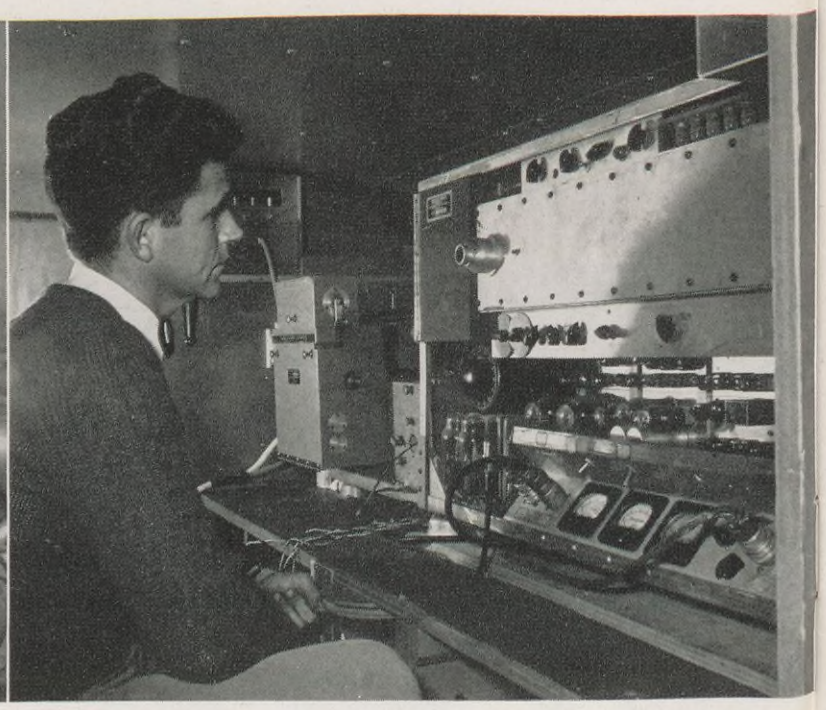
Working with an enlarged staff and expanded facilities, the Exploration and Production Research Laboratory at Houston continued its efforts during the year to improve old methods and discover new ones for finding and recovering crude oil. Staff members studied the nature and distribution of sediments in underground reservoirs, the flow of fluids in the porous reservoir rocks and the nature and propagation of artificially produced elastic waves in the earth.

New instruments were devised in 1950 to aid in this fundamental research. One newly-developed instrument measures the velocity of seismic waves in the surrounding rocks at each five-foot interval as it is lowered into the well. Another device was developed for sealing and injecting instruments and attached electric cables into oil wells having a high well-head pressure.

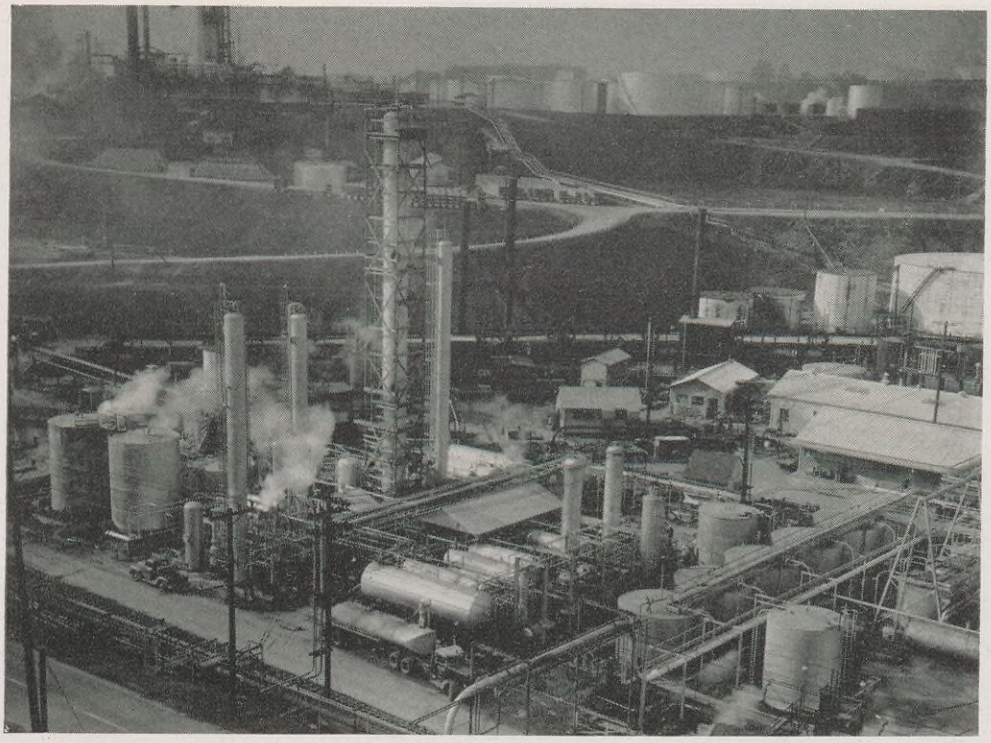
The progress made in perfecting these instruments and in the more important fundamental studies keeps Shell abreast of the latest tools and techniques for finding and producing crude oil.



This is a close-up of the balance mechanism used in the Weigh-O-Matic Tank Battery, an installation for automatically measuring crude oil production at the Hobbs Field in Lea County, New Mexico.



This truck-mounted surface equipment was developed by the Exploration and Production Research laboratory in Houston for measuring the velocity of seismic waves in the different layers of earth penetrated by a given well.



The Martinez Refinery doubled its capacity to manufacture petroleum sulphonates for motor oil additives in 1950.

Manufacturing

ALONG with the rest of the industry, Shell processed more crude oil in 1950 than ever before and prepared for still greater throughput. Crude runs to the five refineries averaged 356,000 barrels a day . . . up 5.1 per cent over the record operations of 1949 . . . and plans were put into effect to extend refining facilities to meet anticipated further increase in demand.

Scattered but significant construction during the year added to refinery capacity. New flashing equipment at the Wilmington Refinery, for example, increased the intake capacity of the catalytic cracking unit there. Other facilities installed at Martinez more than doubled that Refinery's capacity for manufacturing petroleum sulphonates, a lube oil additive now in great demand. At Wood River Refinery, a thermal cracking unit was converted into a crude distilling plant to help handle the heavy flow of crude oil coming in from the Basin-Ozark Pipe Line System.

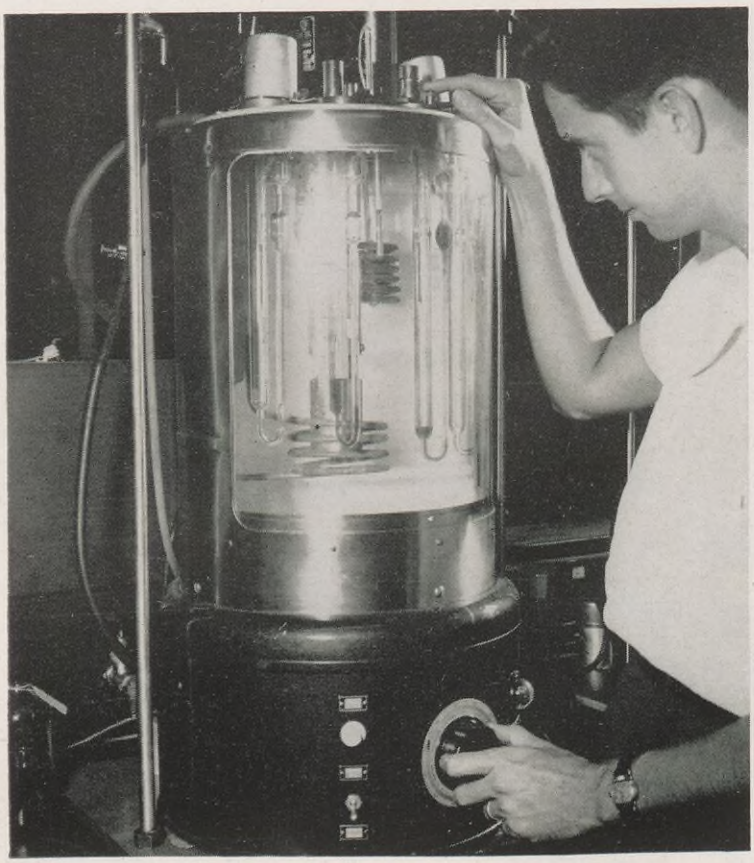
Other construction added to the diversity of products. A new plant was completed at Wood River for the production of solvents for making odorless paints. And at the Wilmington Refinery, a toluene plant was altered so that it could also produce synthetic benzene—a product important in the manufacture of synthetic rubber, plastics and nylon. This is the first instance of the commercial production of this critical chemical from petroleum.

The year also saw completion of the Montreal Refinery expansion, an operation in which Manufacturing supplied technical aid in design and construction to Shell Oil Company of Canada. Completed at a cost lower than that originally estimated, the completed extension almost doubles the Montreal Refinery's previous throughput capacity.

There were other minor projects at each refinery, but on the whole, construction in 1950 was limited to relatively small projects designed to improve the efficiency or flexibility of operations or to remove bottlenecks blocking greater throughput.

Faced like the rest of the industry with meeting heavy military and civilian demand in the future, Shell made extensive studies in 1950 to determine the best location for installing additional crude refining facilities. The studies led to the selection of Wood River Refinery as site of the expansion, and to the decision to increase the rated capacity of the Refinery from 120,000 to 150,000 barrels a day. Work was begun on the design of a new crude distillation unit there, new gas recovery facilities and other planned extensions which will increase catalytic cracking capacity.

Both processes and products were improved by 1950 research and de-

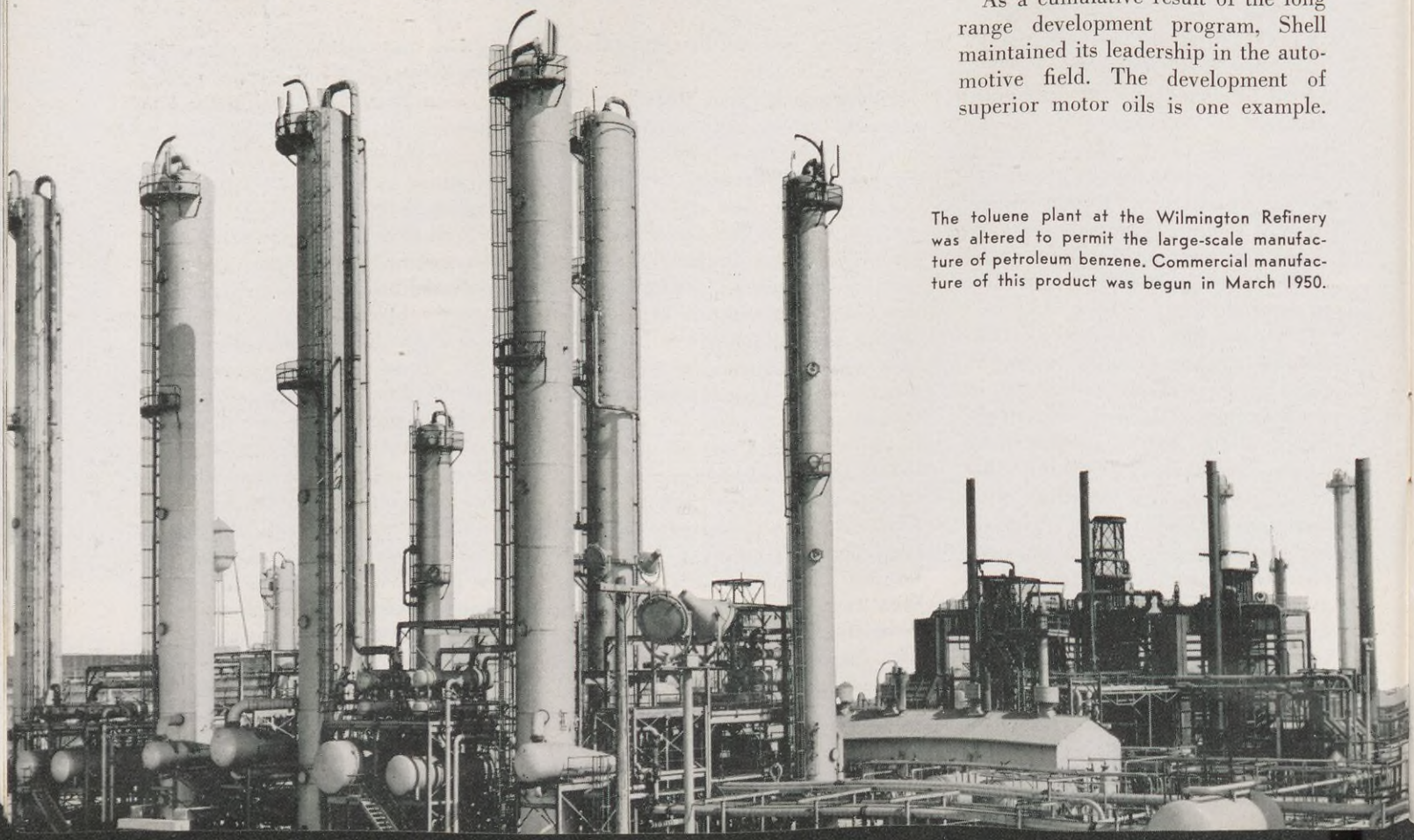


This viscosity determination at the Research Laboratory at the Houston Refinery was just one of many different tests employed by Shell research laboratories during the year to improve refinery products and manufacturing processes.

velopment activities. The Houston Research Laboratory made improvements in the catalytic cracking and fractionation processes which have increased the efficiency and profitability of both operations. The research laboratory at Martinez Refinery neared completion of its vast road testing program in which, altogether, more than 150 test gasolines will be evaluated based on the performance of each one in over 400 standard design cars. Heavier oils also were tested at Martinez. During the year, a 6-cylinder, full-sized Diesel locomotive engine was bought by the laboratory and installed for testing and improving Talona and other railroad Diesel lube oils.

The Wood River Research Laboratory was active too. In addition to extensive research on jet fuels and aviation gasolines, it successfully reformulated certain heavy duty oils in 1950 to meet the revised requirements of the armed forces. Other laboratory activities resulted in the installation of permanent facilities at Wood River for making an improved asphalt roofing flux of superior weathering qualities.

As a cumulative result of the long range development program, Shell maintained its leadership in the automotive field. The development of superior motor oils is one example.



The toluene plant at the Wilmington Refinery was altered to permit the large-scale manufacture of petroleum benzene. Commercial manufacture of this product was begun in March 1950.

Another 1950 development saw Shell begin work on the design of a new crude distillation plant and other refining units at Wood River. The Refinery's expanded throughput capacity will help Shell meet future increases in demand.

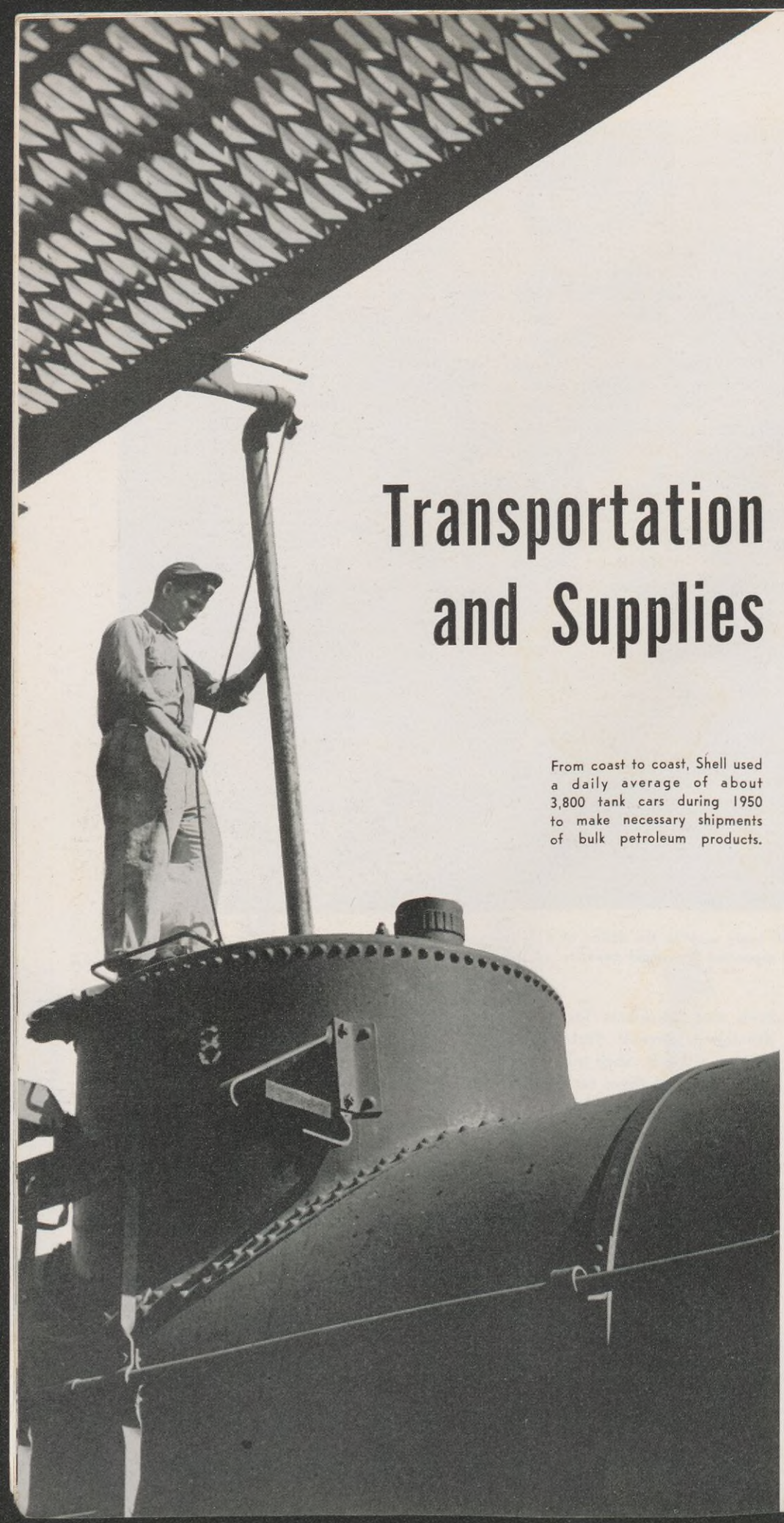
With 1950 improvements, X-100 reached a new high in performance, and today the Shell-pioneered incorporation of wear-resisting additives in motor oils is recognized by automotive and petroleum industries alike as a major requirement of the modern engine lubricating oil. Hydraulic fluids are another example, Shell being one of the first companies to have a complete line of hydraulic fluids meeting the exact needs of all the various types of automatic transmissions now used by passenger cars and busses.

The same leadership was maintained in the aviation field. During the year Manufacturing developed fuels and lubricants for the newly-developed aircraft turbine engines and, as a result, Shell now supplies a large share of these turbine aircraft requirements along with its regular products for commercial and military reciprocating engines. Other Manufacturing efforts produced special airframe lubricants which now enable Shell to provide a large number of airlines with their hydraulic fluid and grease requirements. One such product, a synthetic extreme pressure aircraft grease, has set a new standard for the industry.

In the agricultural field, the Modesto Laboratory came up with several promising agricultural chemicals in 1950. These are currently undergoing field tests to determine their applicability as soil fumigants and foliage fungicides.

The year past found Manufacturing concerned with economy as well as new manufacturing techniques, and a rigorous program of maintenance control combined with the efficiencies of the maintenance shops at Houston Refinery and improvements in shops and tools at the other refineries resulted in important savings. With operating and maintenance efficiencies, expanded capacity and progressive research, Manufacturing is prepared to meet the heavy demands of the future.

Transportation and Supplies



From coast to coast, Shell used a daily average of about 3,800 tank cars during 1950 to make necessary shipments of bulk petroleum products.

DURING the first half of 1950, oil industry operations were depressed principally as a result of the low demand for heating oils due to the mild weather in the 1949-50 winter season. Beginning at midyear and continuing throughout the remainder of 1950, operations increased rapidly to meet increasingly higher demands resulting from expanding industrial production and military needs for Korea and elsewhere. By January, 1951, demand for oil had risen to about 7,700,000 barrels a day and available supply to 7,500,000 barrels a day—a gain of 17 per cent in demand and 20 per cent in supply over January, 1950. Where a year ago the industry had surplus production, refining, and transportation capacity, it now seems likely that further expansion will be necessary to meet the requirements of the Defense Program.

Total demand for oil in 1950 averaged about 6,800,000 barrels a day, a gain of some 650,000 barrels a day over 1949. This gain of more than 10 per cent was the largest ever made in one calendar year. To meet demand, crude production averaged 7 per cent higher, natural gasoline production 15 per cent, imports 30 per cent, and refinery runs nearly 8 per cent.

Shell's supply situation followed rather closely that of the industry. Due to the mild winter of 1949-50, heating oil stocks were too high, and it was necessary to curtail refinery intakes to bring the position into balance. By midyear, however, this condition had been corrected and refinery operations were increased. For the remainder of the year refinery intakes were pushed to the highest possible levels and in November a new record of 411,000 barrels a day was established. In addition to lubricating oils, technical products, and other products moved in relatively small volumes, Shell supplied more than 100,000,000 barrels of gasolines and light heating oils and 30,000,000 barrels of residual fuel and asphalt during the year.

East of the Rockies, sharply increasing demands of Shell's refineries

were met from both increased production and purchases of crude. Additional pipe line transportation was obtained by utilizing space in outside lines from West Texas to the Texas Gulf Coast and all capacity in Shell's lines was used to the fullest extent. On the Pacific Coast, the increased demand during the latter half of the year was partially met by the opening up of production which had been shut in since 1949; partially by increased purchases of crude; and by a limited withdrawal from stocks.

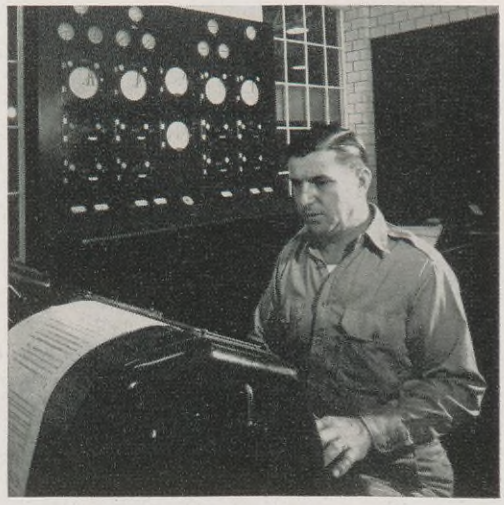
Shell's volatile and natural gasoline business continued to grow during 1950. Natural gasoline supplies for movement by pipe line were sufficient to meet refinery requirements and no spot natural gasoline purchases were necessary. Shell was successful in making spot purchases of butanes to cover its needs although industry supplies of butanes were generally short of meeting demand during the peak winter months. In 1951 Shell's supplies of natural gasoline and volatiles will be augmented by production from the recently completed Elk City Plant.

Shipment by tanker of excess residual fuel oil from the Pacific Coast to the Atlantic Seaboard continued through the first few months of 1950. Shell participated in this movement, which got under way in the last months of 1949. The total industry volume amounted to about 25,000,000 barrels or 250 tanker shipments. After April, the demand for fuel oil on the Pacific Coast increased greatly, and with tanker rates increasing, shipments to Atlantic Coast ports were discontinued.

During the first part of 1950, with reduced demand and curtailed supply, marine transportation continued to be freely available at very low rates, and many ships were in lay-up. By the end of the year, however, nearly all available ships were in operation and tanker rates were as much as five times the rates that had prevailed in January, 1950. Tanker transportation for Shell accounted for the movement of seventy-two million barrels of crude oil and products in bulk, representing an increase of 11½ per cent over the total for 1949. On the Great Lakes and Inland Waterways, more than fifty million barrels of crude and refined oils were moved by barge tows and coastal tankers, while more than ten million barrels of crude and products were delivered by these means on the West Coast.

Pipe Line Throughput High

In California, transportation of crude oil through Shell's system of pipe lines continued at a high rate. Throughput in the Ventura-Wilmington natural gasoline pipe line increased to more than 4,200 barrels daily. The products pipe line from Wilmington Refinery to the Los Angeles Pipe Line Terminal transported more than 2,000,000 barrels of motor gasoline during the year.



Input pressure and other flow information for the East Products Pipe Line is relayed from the Wood River control room, shown at right, to the Chief Dispatcher's office in New York Head Office via teletype.

The picture above shows a tank car loading pump being started at the East Chicago terminal. During 1950, Shell's shipments of bulk petroleum products by tank car averaged approximately 145,000 barrels a day.

The North Salem, Indiana, booster station below is one of four new automatic stations along the East Products Pipe Line which can be operated by remote control from the New York Dispatching Office.

It is planned to tender heating oils in this pipe line in 1951, which will increase throughput by 1,200 barrels a day.

On the East Products Pipe Line between Wood River, Illinois and Zionsville, Indiana, four new type remotely controlled pump stations were placed in operation permitting an increase in line throughput of about 4,000 barrels a day. These new booster stations, with electrically controlled pumps and valves, operate upon receipt of signals transmitted by teletype and originating from a central dispatching office in New York. By means of telemeter equipment, the suction and discharge pressures and electrical load of each station are automatically reported merely by dialing a code number in Head Office, New York.

The extraordinary growth of demand in the South Atlantic states served by the Plantation Pipe Line, in which Shell has an interest, necessitated a $50,000,000 expansion program in this pipe line system. In December, construction was begun on 432 miles of eighteen inch, and 275 miles of fourteen inch pipe, parallel to the present main line together with additional pump stations. This will increase the capacity of the system to 167,000 barrels a day initially, and ultimately more than 300,000 barrels a day can be moved by adding pump stations.

The industry's supply of tank cars was extremely short on a number of occasions. During the last winter season, there were times when heating oil was available, but there were no cars for shipment. It is estimated that the industry requires some 7,000 additional tank cars and, while a portion of these have been ordered, delivery is uncertain due to steel allocations. The general outlook is that tank cars will continue to be scarce during peak demand periods until additional cars can be built. Shell continued to make great use of rail and "for hire" truck transportation during 1950. Shipments of bulk petroleum products by these means averaged approximately 145,000 barrels a day. About 800 tank cars were in daily use during the year on the Pacific Coast and 3,000 East of the Rockies.

During the year, Shell added facilities to its bulk distribution system, which now consists of five refineries and 107 major and secondary terminals. About 1,300,000 barrels of storage capacity was added at existing terminals and at two new terminals, one located at Argo, Illinois, in the Chicago metropolitan area, the other at Colusa, California, serving the Sacramento area. In addition, new terminals are under construction at Memphis, Tennessee, where finished products will be received by barge; at Searsport, Maine, for receipt of gasoline and fuel oil by tanker; and at Akron, Ohio, where stocks will be supplied by products pipe line. More new terminals and much additional storage at present terminals are planned for construction during 1951.

Tankers like the ocean-going SS. Ticonderoga pictured at left at Martinez, California, accounted for the bulk movement of 72 million barrels of crude oil and products for Shell during 1950.

Lake tankers like the one pictured below loading at the East Chicago terminal, together with barges transported about sixty million barrels of Shell crude and refined oils on inland waterways.

Expanded facilities at the Willbridge, Oregon, Terminal were part of a broad 1950 construction program.

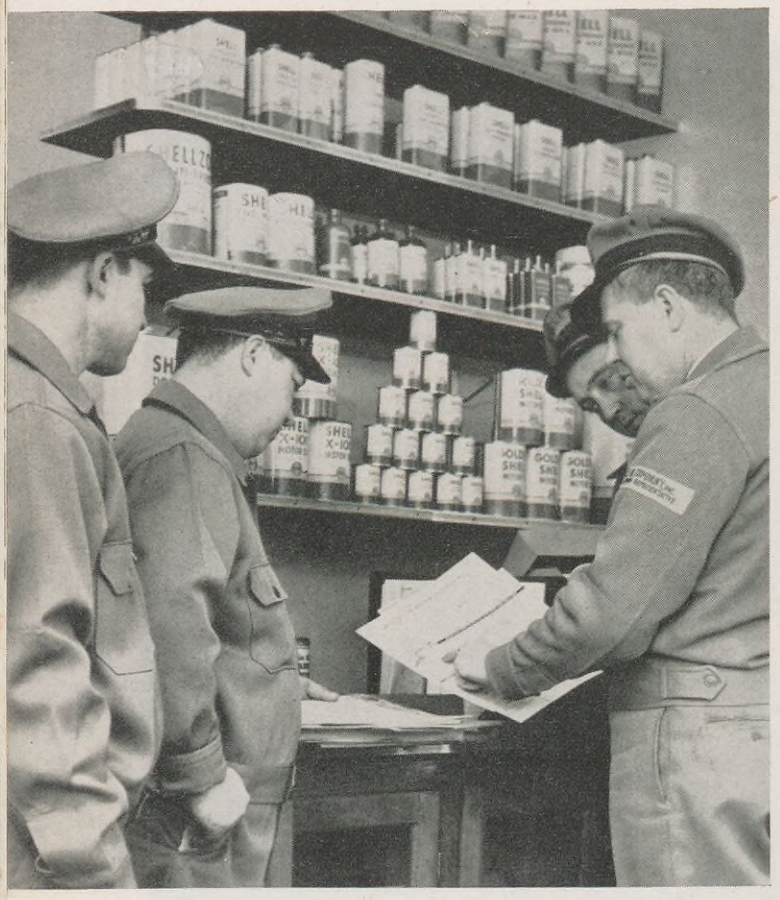
Marketing

DEVELOPMENTS in petroleum marketing in 1950 closely paralleled those in the over-all U. S. economy. During the first half of the year the trend in consumer income and spending was upward and petroleum products demands followed a rising pattern determined by record sales of automobiles, oil burners, trucks, tractors, and other petroleum consuming items. After the outbreak of the Korean war at midyear, consumer spending spurted for several months in a wave of scare and forward buying. Petroleum demands reflected this accelerated spending during the third quarter as suppliers attempted to fill storage in anticipation of possible shortages. Gradually, in the fourth quarter, demands returned to a more normal, but still high, rate of increase over the preceding year.

Petroleum product prices, on the other hand, were caught in a cross current during the first half of the year. Refinery and wholesale prices gradually advanced in response to increased demands and better inventory levels. Retail prices, most notably gasoline at service stations, failed to reflect these increases immediately. Intensive competition among service stations, brought about by the rapid spread of multi-pump, cut-price stations, led to an increasing number of price wars in major consuming centers. The effect of this was to reduce average per gallon sales revenue for gasoline, the biggest item in petroleum marketing. However, the fact that a record number of new automobiles hit the road in 1950, combined with increased fuel consumption per vehicle, raised the demand for gasoline 8.5 per cent above 1949—raised it, in fact, to an all-time record high.

In spite of a moderate reduction in unit proceeds, Shell had a record year in both marketing volume and total dollar revenue from the sale of Shell products. Again, as in 1949, the Company out-performed the U. S. oil industry in terms of percentage gain in sales volume over preceding years. Both East of Rockies and Pacific Coast operating territories contributed to the better-than-industry performance. Shell returned to its former position as No. 2 marketer of motor fuel in the five West Coast states.

While sales volume went up, the unit cost of marketing Shell products



Service station operators were given increased assistance aimed at raising throughput and reducing unit costs to meet stiffened retail competition. Above, a Shell merchandising representative talks to a station staff in Wadsworth, Ohio.

Aviation gasoline sales increased sharply during the year as a result of stepped-up airline operations and more plane production. Sales to the Military were at a post-war low during the first half of the year, but rose rapidly with action in Korea.

went down. Contributing to this improvement was the application of the results of studies made in marketing methods and procedures—studies aimed at improving efficiency and increasing productivity at both operating and administrative levels.

To strengthen further Shell's marketing position, a well-rounded program of service station construction and modernization was carried out in 1950. This program, coordinated with competitive pricing, selective abandonment of low volume stations, aggressive advertising, and the teamwork of a well-trained sales and merchandising staff, must be credited with the success achieved in Shell's marketing territories. Both existing stations and those newly acquired showed substantial gains in unit throughput by comparison with 1949. Continued accent on the Activated Shell Premium Gasoline campaign led to increased sales of this product in contrast to a decline in national consumption of premium gasolines.

Intensified retailing competition made it necessary to step up the tempo of Shell's long-standing activity aimed at increasing the throughput of individual service stations and reducing their unit costs. Extensive research and a number of surveys were carried out during the year to develop more effective methods and techniques.

Light Fuels Scarce

Light fuel oils were in relatively tight supply for Shell in 1950, particularly during the second half of the year. This was in sharp contrast to the previous year, when a warm heating season provided a substantial inventory carry-over. Near record installations of oil burners and space heaters, sharply increased consumption for tractors, brooders, tobacco curers and similar items, plus record diesel oil consumption by railroads, all forced demands for kerosene and distillate fuels upward and a sales program tailored for regular customers only disposed of Shell's entire available supply.

A fuel oil program inaugurated in 1949 for selective jobber development with emphasis on Shell branded fuels, achieved further success in 1950. The program was aided by aggressive advertising of the new burner fuel containing FOA-5X—the anti-clogging agent. The net result for the year was an improvement in the quality of Shell's representation in all desirable fuel oil markets.

Aviation gasoline sales increased sharply during the year as a result of increased airline operations and stepped-up plane production. Sales to the Military were at a post-war low during the first half of the year. Like

Schools in marketing operations, fundamentals of the petroleum industry, and jobber marketing were conducted to increase personnel efficiency. Above, a marketing analyst discusses a point during class held in Westport, Conn., last October.

Studies in effective handling of bulk and package products at terminals and depots continued. Above, a truck loading test is conducted with a fork lift using a new type of "slenderized" drum. This type drum saves space and handling time.

the rest of the oil industry, Shell found itself temporarily short of high octane components required to make the much greater quantities of military aviation fuels ordered by the Government after the outbreak of the Korean action.

The U. S. demand for lubricants went along with the general upward trend. Shell sales to both automotive and industrial consumers increased in proportion to over-all consumption advances. Aggressive promotion again shifted the volume of sales increases toward X-100 Motor Oil. Prices for lubricating oils, which had been in a slump through 1949 and early 1950, strengthened in response to the general high level demands.

Asphalt demands also rose during the year as highway and industrial consumption rose. The increase in U. S. Industry demand over 1949 is estimated at about 15 per cent. Shell sales were well ahead of this average increase.

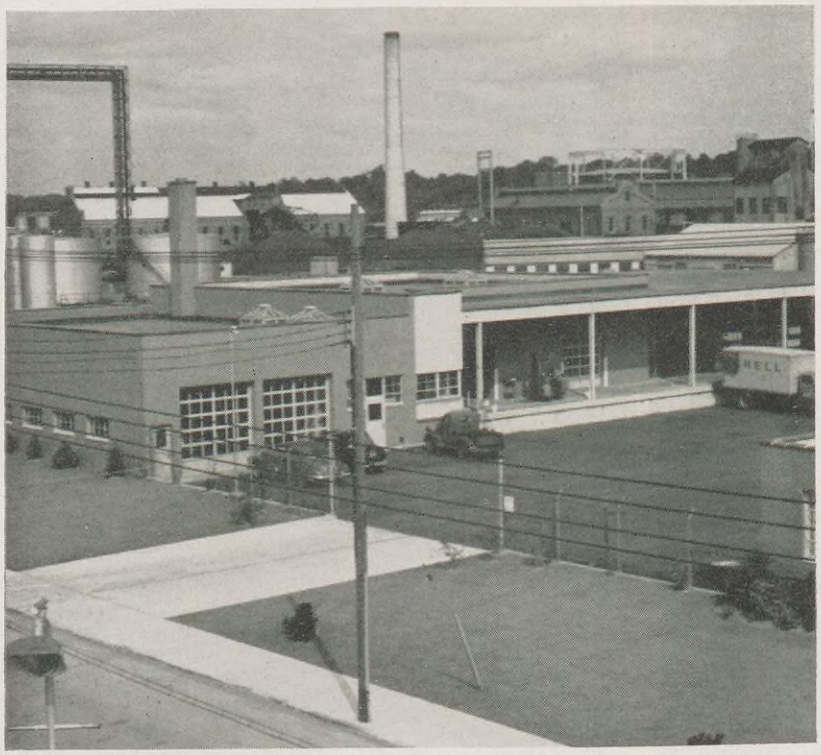
Liquefied Petroleum Gas sales expanded so rapidly during the year that requirements of contract customers approximately equalled Shell's plant capacity during the last quarter. The distribution of Shellane was changed early in the year from a commission distributor to jobber basis, resulting in more effective market development. The entire field of L.P.G. distribution is under complete analysis in a search for the most effective and profitable methods of operation.

Special Products Demand High

Sales of wax, naphthas, solvents and process materials showed major increases and, in the case of certain extracted aromatic solvents, demand is now greater than plant capacity.

Marketing Operations completed a number of major projects during 1950 in the form of new, modernized and expanded plant facilities designed to increase distribution volume and efficiency. Currently under construction are new installations at Searsport, Maine; Akron, Ohio; Colusa, California, and Memphis, Tennessee. Major improvements are under way at a number of depots and terminals in both East of Rockies and Pacific Coast operating territories. A new terminal and depot at Argo, Illinois, providing additional low-cost barge input into the Chicago area of all light refined oils was a major plant completion in 1950.

A comprehensive review and evaluation of all local markets was conducted during the year. The Marketing Divisions played a large part in this study by analyzing local conditions and factors relative to gallonage potentials and economic market qualities. The results of the study will



Expansion at Mt. Vernon Depot above was among the major Marketing construction projects completed in 1950. Several long term expansion and modernization projects continued across the country.

lead to planned development of all markets, using that method of operation (Salary, Commission or Jobber) which is most economically sound, profitable and in the best interests of both Shell and its customers.

Efforts to increase Marketing personnel effectiveness were furthered by conducting schools in Operations, fundamentals of the petroleum industry, and jobber marketing. The course in jobber marketing was aimed at developing greater profits for jobbers and greater sales, through better representation, for Shell. The key personnel attending acquired information on new and revised policies and jobber aids to be used with their jobber customers. A similar school was held on the West Coast early in 1951.

In summary, Marketing's activities during 1950 were highly satisfactory. Gains in volume of sales were outstanding.

This favorable trend should continue in 1951 unless the international situation deteriorates to the point where restrictions will be placed on marketing activities.

A new Shell service station going up at Oakland, California, below was part of a continuing service station construction and modernization program. Average station throughput increased in 1950.

Highlights from the Annual Report for 1950

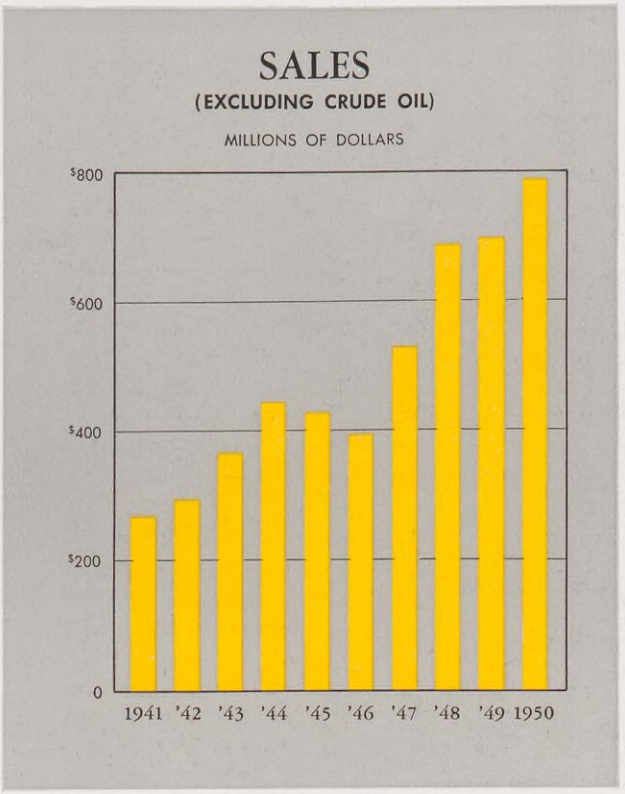
"NET INCOME of your Company in 1950, after all charges including Federal taxes on income, amounted to $90,121,000, equal to $6.69 per share, which compares with $76,423,000 and $5.67, respectively, in 1949. A true comparison, however, can only be made on the basis of earnings before Federal income taxes, since the tax rate applicable to 1950 was substantially increased over the preceding year. The earnings before Federal income taxes in 1950 were $137,921,000 as compared with $101,423,000 in 1949. The improved results of your Company for the year 1950 are attributable to a number of factors, the principal ones being (a) increase in crude oil production, (b) increased sales of products, (c) a general hardening in prices during the second half of the year and (d) improvements in operating efficiency.

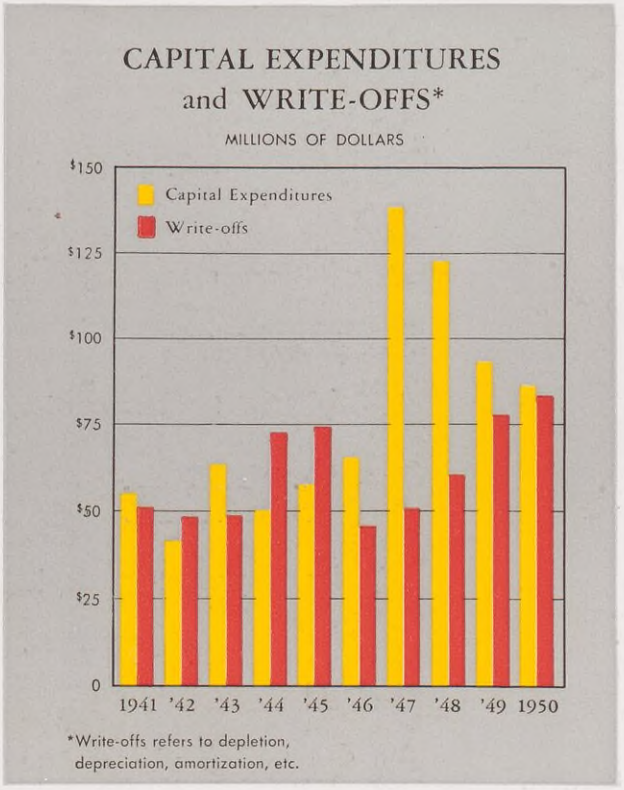
"Dividend payments totaled $3.00 per share for 1950, the same as in the previous two years. Early in the year your Directors decided to adopt a quarterly basis for the payment of dividends. For the first and second quarters the payment was 50 cents per share, which was increased to 75 cents in the third quarter. The final quarterly payment in December comprised the 75 cents regular dividend plus 50 cents per share extra dividend.

"Your Directors believe it is essential to maintain a strong cash position in the present state of world affairs. It is therefore gratifying to note that at December 31, 1950, cash and Government securities aggregated $137,168,000 as compared with $73,056,000 at the close of the year 1949. It is also of interest that the cash resources of your Company were in excess of the Company's funded debt which amounted to $117,307,000 at the year end.

"An important factor affecting the cash position is the amount of capital expenditure. During 1950 this totaled $86,651,000, being $6,564,000 less than in 1949 and only slightly in excess of the year's provisions for depletion, depreciation, amortization and other write offs aggregating $82,969,000. With the virtual completion in 1949 of the large programs of expansion and modernization of plants and facilities, the expenditures in these categories during 1950 consisted mainly of normal replacement and rehabilitation. Of the total capital expenditure, 64% was expended on drilling and development work essential to maintain the Company's crude oil production position and to strengthen its reserves of crude oil.

"It is noteworthy that the funds for capital expenditures over the last five years, 1946-1950, amounting to $506,556,000, have been entirely provided by write offs and retained earnings."





Statement of Financial Cond

we own

current assets

money in offices and banks		48 million
U.S. government securities		89 million
due from customers and affiliated companies		86 million
inventories—crude oil, refined products, materials and supplies		107 million
total current assets		**330** million

properties, plant and equipment

drilling and production		544 million
refineries and plants		361 million
marketing and other		206 million
total properties, plant and equipment		1,111 million
less depreciation, depletion and amortization		768 million
net properties, plant and equipment		343 million

other assets

50 million

total assets

723 million

ndition – December 31, 1950

we owe

current liabilities

owed to suppliers and others — **82** million

owed for taxes — **60** million

total current liabilities — **142** million

bondholders' investment — **117** million

total liabilities — **259** million

shareholders' investment

capital — **216** million

earnings employed in the business — **248** million

total — **464** million

total liabilities and shareholders' investment — **723** million

Income Statement

what came in

from customers and others

920 million

what went out

to suppliers for goods and services

511 million

to more than 30,000 Shell employees for wages, salaries and benefits

156 million

towards replacement of plant, equipment and crude oil underground

83 million

direct taxes— federal, state and local

77 million

to bondholders for interest

3 million

what was left

profits from the year's business

90 million

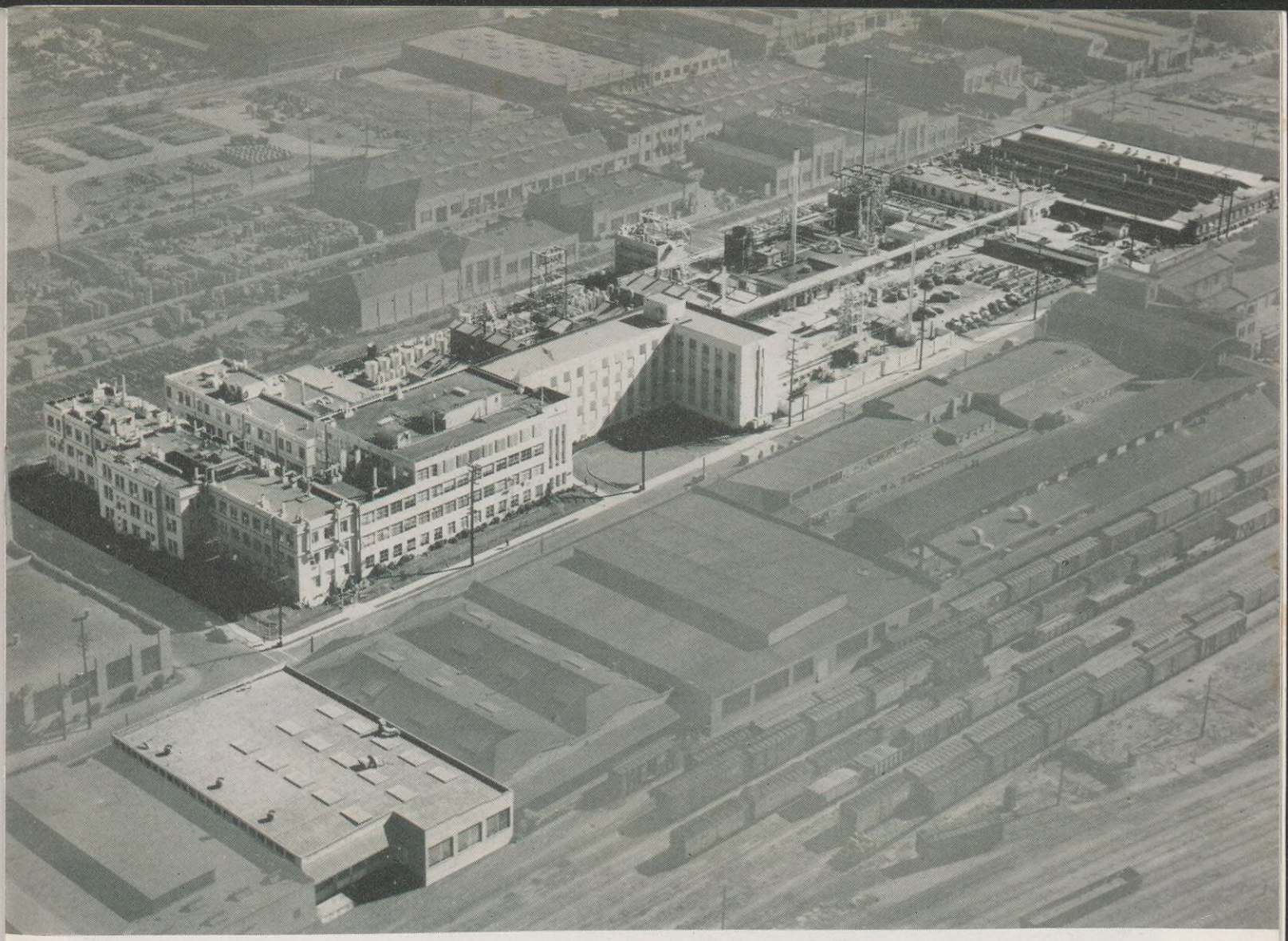
divided as follows

dividends to the more than 17,500 shareholders who invested their money in the company

40 million

retained earnings employed in the business

50 million



Expansion of physical facilities and consolidation of operations of Shell Development Company were carried out during 1950.

Shell Development Company

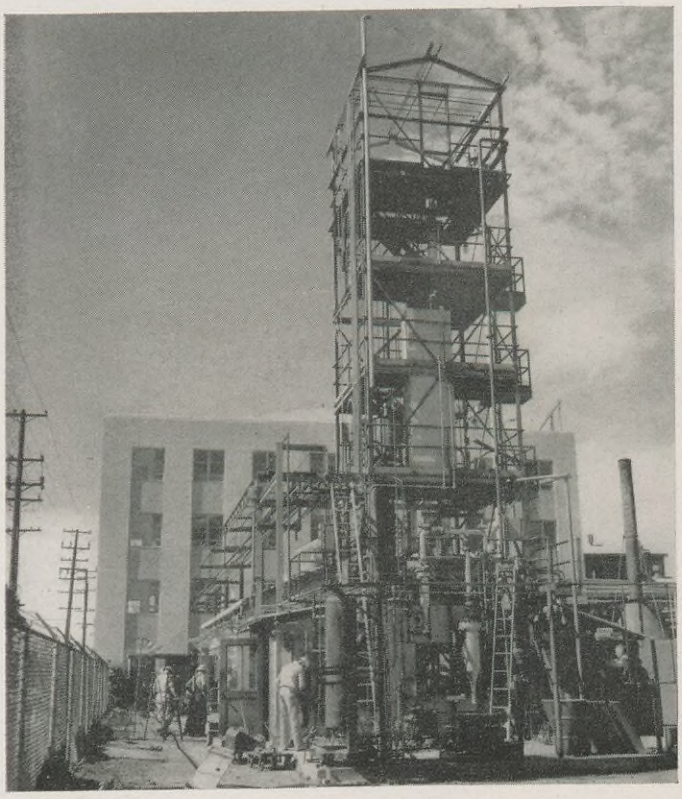
THE past year saw Shell Development Company adding to its stock of basic information in a continuation of the program begun in 1949. Close attention was given to general trends in the petroleum and chemical fields in order to establish the directions in which research will be most effective during the coming years. And in the interest of efficiency, the Company planned and carried out a program of expansion, consolidation and reorganization.

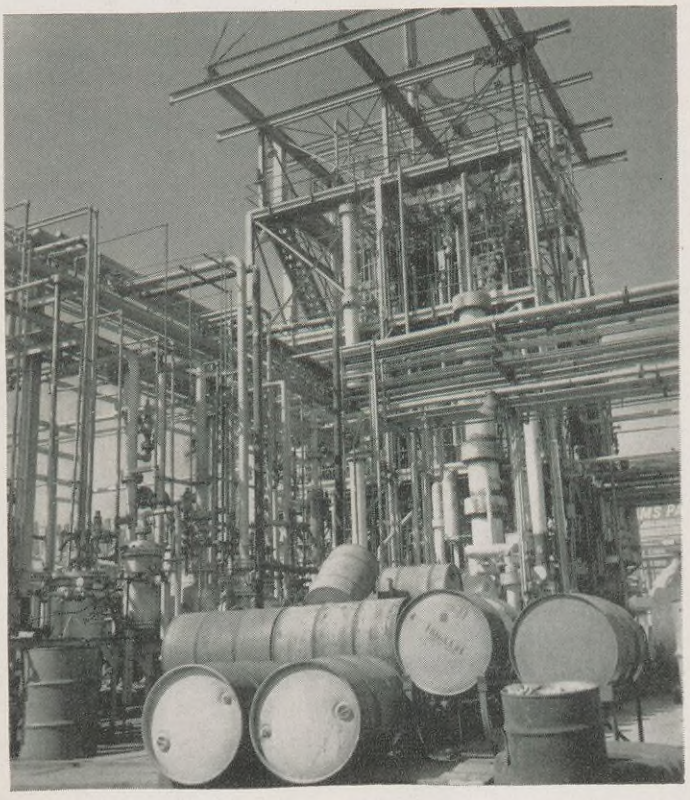
The riddles concerning composition and chemical behavior of heavy oil fractions, lube oil stocks and asphalts were investigated further in 1950. A new pilot plant was put in operation so experimental findings on cracking could be translated into actual processing of stocks under conditions similar to those in a refinery. Using the new plant, scientists can check laboratory results on a larger scale—a milestone on the road to increased flexibility, scope and efficiency of refining processes.

A new high-alumina catalyst for conventional catalytic cracking was developed last year. It appears to have advantages over current types and will be given a full-scale trial at Houston.

Intensive work was continued in the lubricants field while in the motor laboratory there was progress in discovering and understanding those factors responsible for deposit formation in engines.

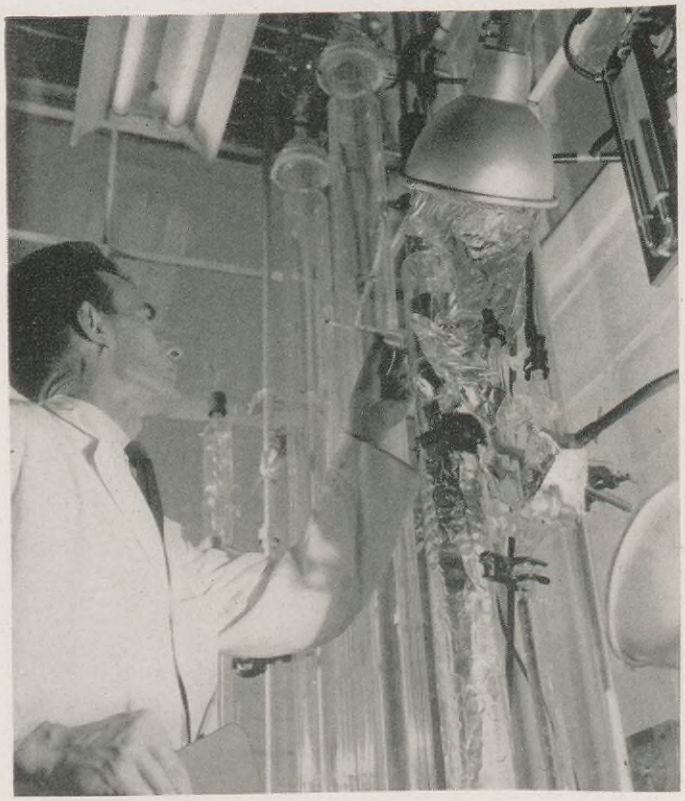
High on the list of important chemicals in 1950 was benzene, a versatile raw material essential for synthetic rubber and widely used in making plastics, detergents and other products. Chronic shortages in the benzene supply developed last year and the heavy demand was reflected in increased interest by many companies in Shell's Extractive Distillation

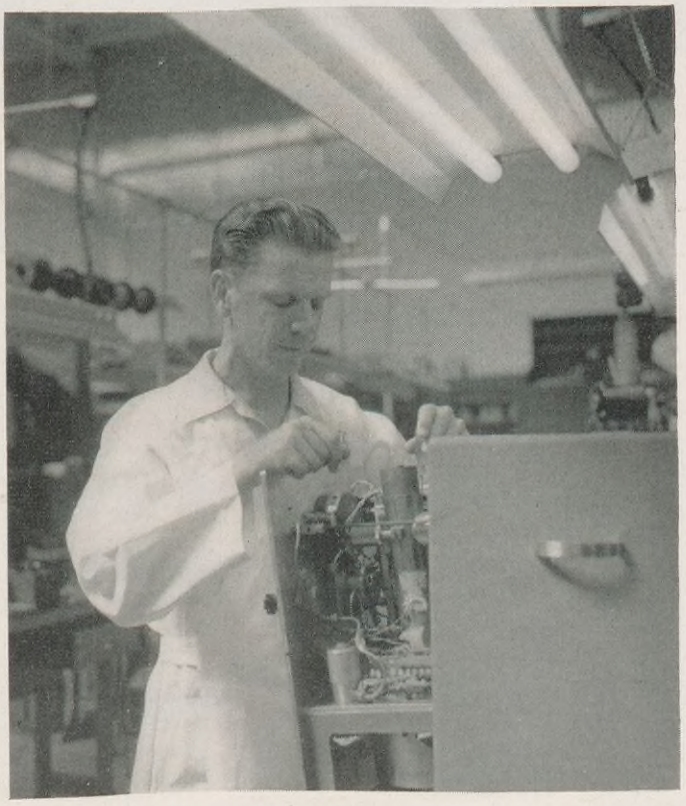




The new pilot plant for experimental cracking studies is shown above. Below, a staff member is pictured in the new Wax Laboratory where the composition and properties of petroleum waxes are studied.

This mass of pipe above is an experimental unit for the production of acrolein, a chemical intermediate. In the picture below, apparatus is being tested in Shell Development's new Instrumentation Laboratory.





process for benzene discovery. This process is used at Shell's Wilmington Refinery where benzene has been produced regularly since March, 1950. Wilmington was the first oil refinery (in 1947) to produce benzene commercially from petroleum.

The staff of the Development Division assisted in the startup of a chemical plant in England for the production of isopropyl alcohol and acetone. They also designed an ethyl chloride plant based on a new Shell-developed process, which is now being built under license agreement for another company in England. The new distillation tray developed by the staff in 1949 was employed in five refineries and chemical plants last year.

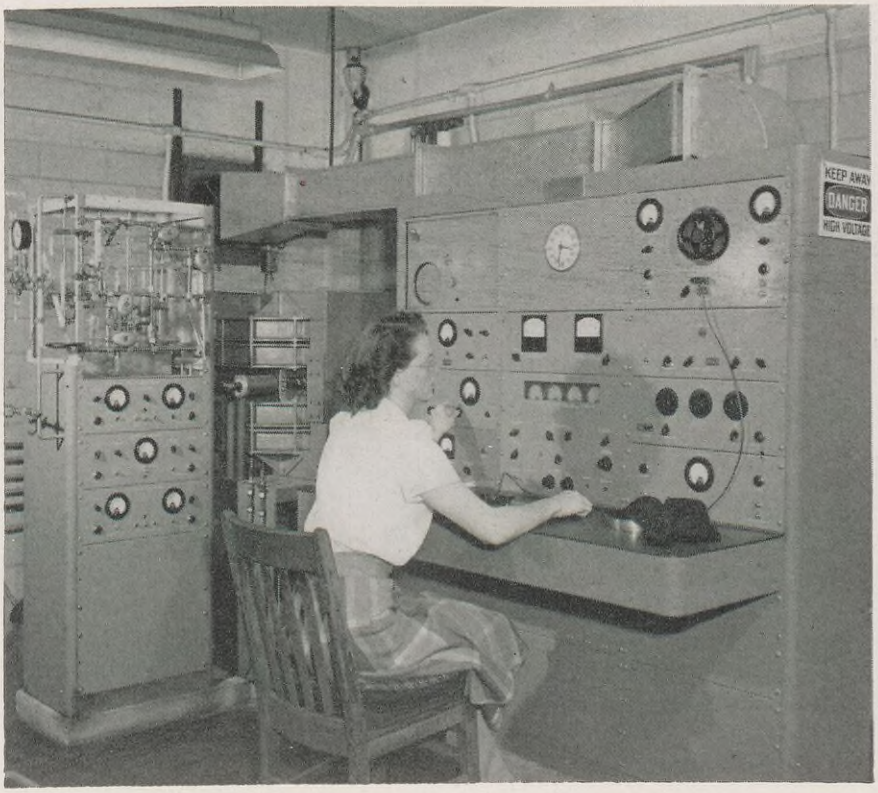
Shell Development followed with interest the U. S. Bureau of Mines research on the use of oils derived from oil shales. The staff was not actively engaged in this project, which has been described as a very long-range effort since prospects for future U. S. reserves of crude oil are encouraging. Of more immediate value to Shell was the discovery that severe well-casing corrosion in the Ventura field was caused by bacteria. A means to eliminate the trouble was developed.

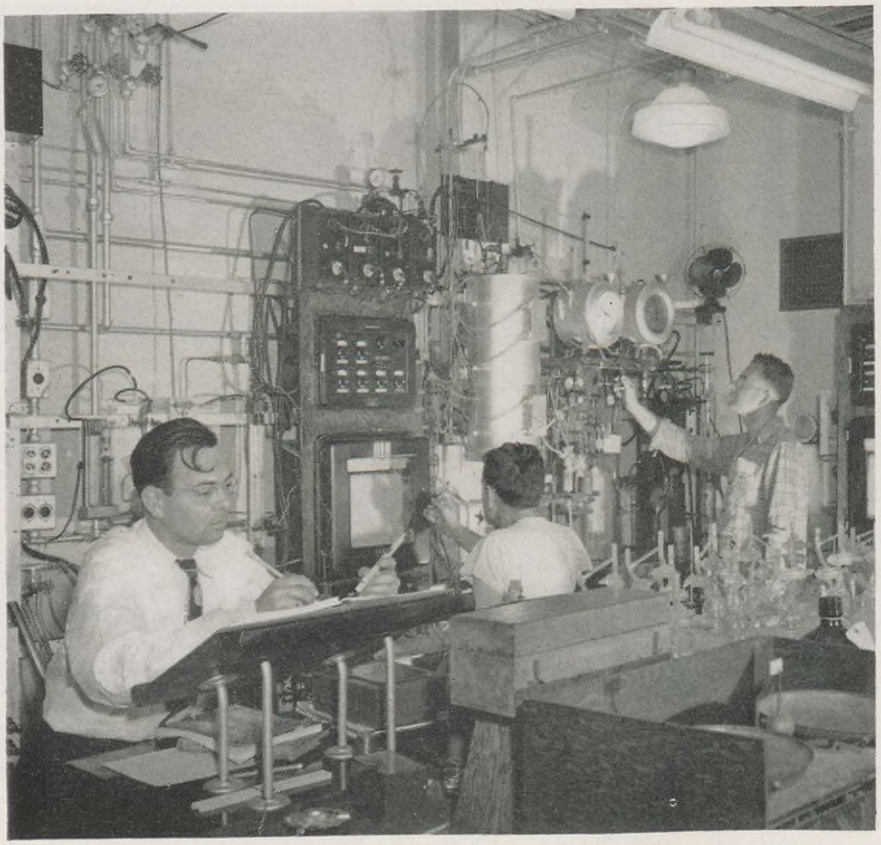
During 1950, further intensive study of EPON* resins was carried out, with emphasis on product application. EPON resins, important in the surface coating industry, are now in commercial production at Shell Chemical's Houston plant. Another newly-developed product with considerable promise in the surface coating field, tert-butylbenzoic acid, was brought to the point at which commercial production is feasible. And to make easier the intermediate-scale production of a wide range of organic chemicals, a new small-scale plant was started.

Agricultural chemicals received considerable attention from Shell Development last year. Working with members of Shell Oil Company's Agricultural Laboratory at Modesto, staff scientists experimented with insecticides, defoliants, synthetic growth-regulating chemicals and herbicides.

* Registered Trademark, U. S. Patent Office.

The machine above tests lubricating oil by measuring the wear on ball bearings running under heavy pressure while immersed in samples of the oil. Below is a mass spectrometer, once a rare item but now widely used for analyzing petroleum products.





Staff members in the picture above are working with the apparatus used for experimental cracking of various feed stocks.

In the Corrosion Department, metallurgical specimens are polished (below) before examination under the microscope.

Large-scale field trials of a promising fungicide-soil fumigant were begun.

Research was continued on a number of projects related to national defense. These were undertaken under government contract.

Fundamental and Supporting Research

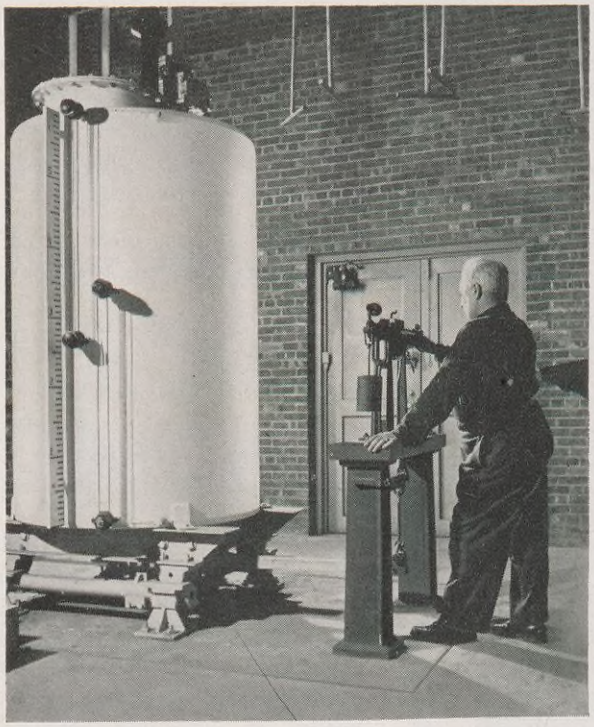
Radioactive tracers and heavy isotopes further establish their value as useful tools for investigating processes during the past year. Radioactive gears, for instance, were used in studying the wear-reducing qualities of gear oils. In another field, both heavy hydrogen and radioactive carbon helped clarify the steps involved when one hydrocarbon is changed into another.

The increasing importance of instruments—to measure, test, analyze and control—was reflected in the development of a host of special apparatus during 1950. One of the latest developments in electronic calculating "brains" was used to study plants or processes from the standpoint of basic control requirements. Several types of testing and analytical equipment were converted to completely automatic operation.

Changes in the administrative organization of the Company last year resulted in the establishment of two major divisions: Research and Development. Each is headed by a vice president and director, with a staff of associate directors and department heads. A third division is responsible for service activities.

The Company's physical facilities were expanded by the provision of a new office building, an Instrumentation Laboratory and extra laboratory space in addition to the pilot plants previously mentioned. Practically all operations were consolidated at the Emeryville Laboratories. An Open House for employees and their families, the press and friends of Shell marked the official opening of the new facilities.

And 1950 ended on an encouraging note as the previous safety record of 1,154,400 man-hours without a disabling accident was surpassed.



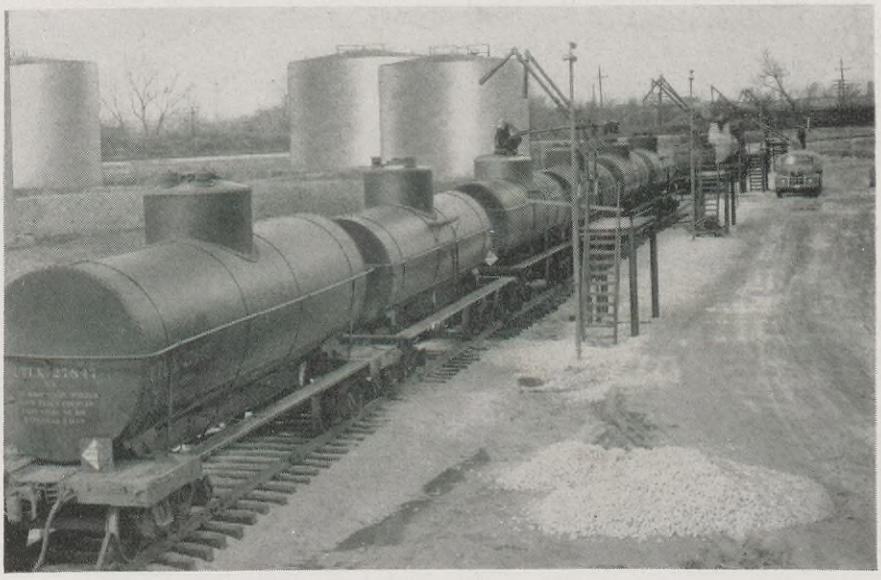
Synthetic ethyl alcohol, being weighed above at Sewaren, was manufactured in better quality in 1950 by improvements effected in the refining techniques.

The Technical Service Laboratory at Union, N. J., completed its first full year of operation. Study of many applications of EPON resins was intensified.

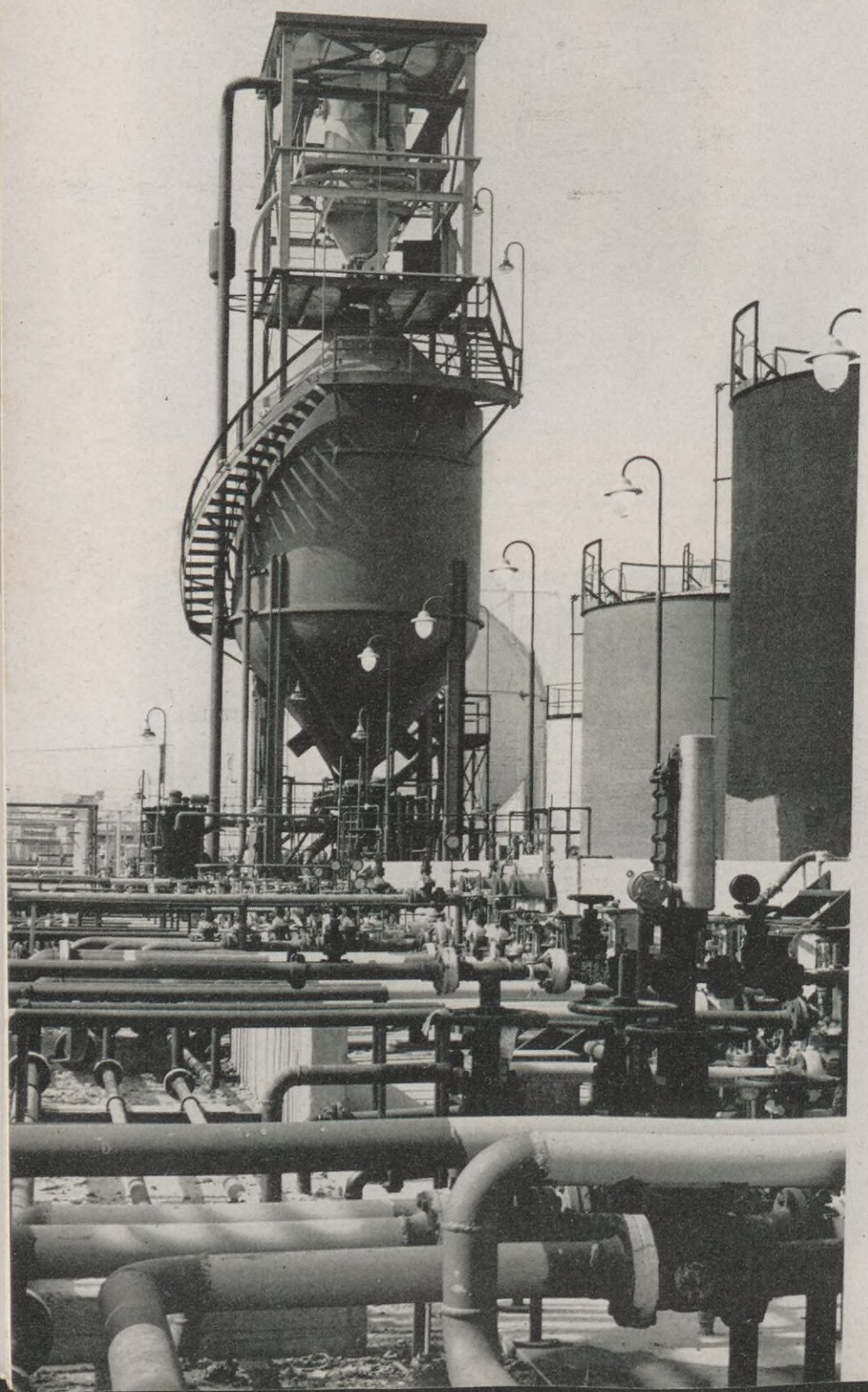
Shell Chemical Corporation

SHELL Chemical Corporation experienced a banner year in 1950, fulfilling record demands, introducing new products and improving others, increasing customer service and generally expanding plant and distribution facilities. Production and sales broke all previous records for the Company, beginning with the general rise in business tempo during the second quarter of the year.

By year's end plans had been announced for a 50 per cent increase in



Distribution facilities for chemicals were improved with the opening of the Argo Marine Terminal (right) at Chicago and the expansion of nation-wide warehousing facilities.



The Shell Chemical synthetic glycerine plant at Houston supplied a big share of the nation's needs. Output will increase 50 per cent in 1951.

glycerine production at the Shell Chemical Houston plant. Since going on stream less than two years ago, the synthetic glycerine plant has provided a significant share of the nation's glycerine supply. Glycerine is used in the manufacture of nitroglycerine for explosives, cellophane for packages, and resins for surface coatings. At Houston, too, improvements in refining techniques made production of a superior synthetic ethyl alcohol possible. Increased production from the plant will shortly make it possible to open new marketing areas for this product in Southern and Midwestern states. Additional grades of denatured alcohol were marketed during 1950 in the East and Northeast through the Sewaren Terminal.

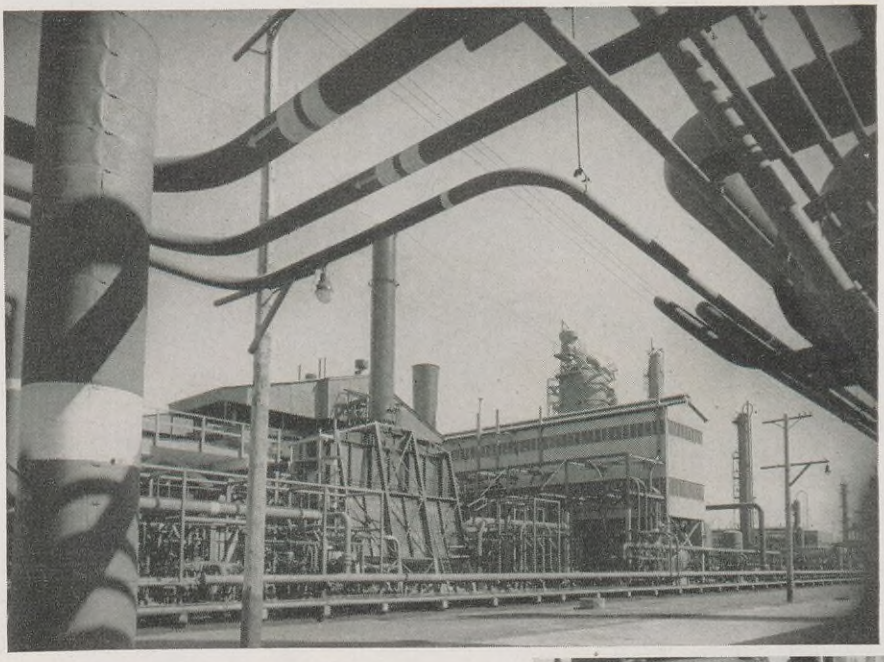
One of the most significant developments of the year for Shell Chemical—and the surface coatings industry—was the establishment of EPON* resin manufacture on a commercial scale. The step marked the Company's expansion into a new field of petroleum-derived chemicals —the resin industry. Following several years of laboratory research, product testing and market development, EPON resins, in four grades, began to flow from a new plant at Houston last November. Simultaneously the new surface coating materials were unveiled in Chicago at the annual "Paint Show" of the Federation of Paint and Varnish Production Clubs. EPON resins provide manufacturers of paint, varnishes and enamels with the answer to a long-standing problem: How to make tough finishes that are hard but not brittle, that are flexible but not soft. In addition, EPON resins offer superior chemical resistance, better heat resistance, and good color stability.

* Registered Trademark, U. S. Patent Office.

In the agricultural field, two of the most powerful insecticidal chemicals yet discovered, "aldrin" and "dieldrin," were introduced. Shell Chemical was named the exclusive national distributor for unformulated aldrin and dieldrin, which are manufactured by Julius Hyman and Company of Denver. Following its introduction in the summer of 1950, aldrin immediately established a reputation for amazing results. For example, during last year's severe grasshopper infestation which centered in the three great Canadian prairie provinces—Alberta, Saskatchewan and Manitoba—aldrin was the only "hopper stopper" used. A bare two ounces per acre were sufficient to give excellent control over the invaders. Both economical and fast-acting, aldrin controls the boll weevil and other cotton insects as well as grasshoppers, ants, and many soil insects. Because of its long-lasting residual control, that is its power to remain effective for an extended period, dieldrin promises great effectiveness against mosquitoes and even DDT-resistant flies.

The increasing tempo of national mobilization was apparent in the reactivation of the Torrance, California, plant to produce butadiene for synthetic rubber. This installation, owned by the Reconstruction Finance Corporation, Office of Rubber Reserve, was operated by Shell Chemical for several years, beginning in 1943. Since 1947, however, the plant had been kept on a stand-by basis. Last August, Shell reopened the plant by calling back trained personnel who were familiar with its operations.

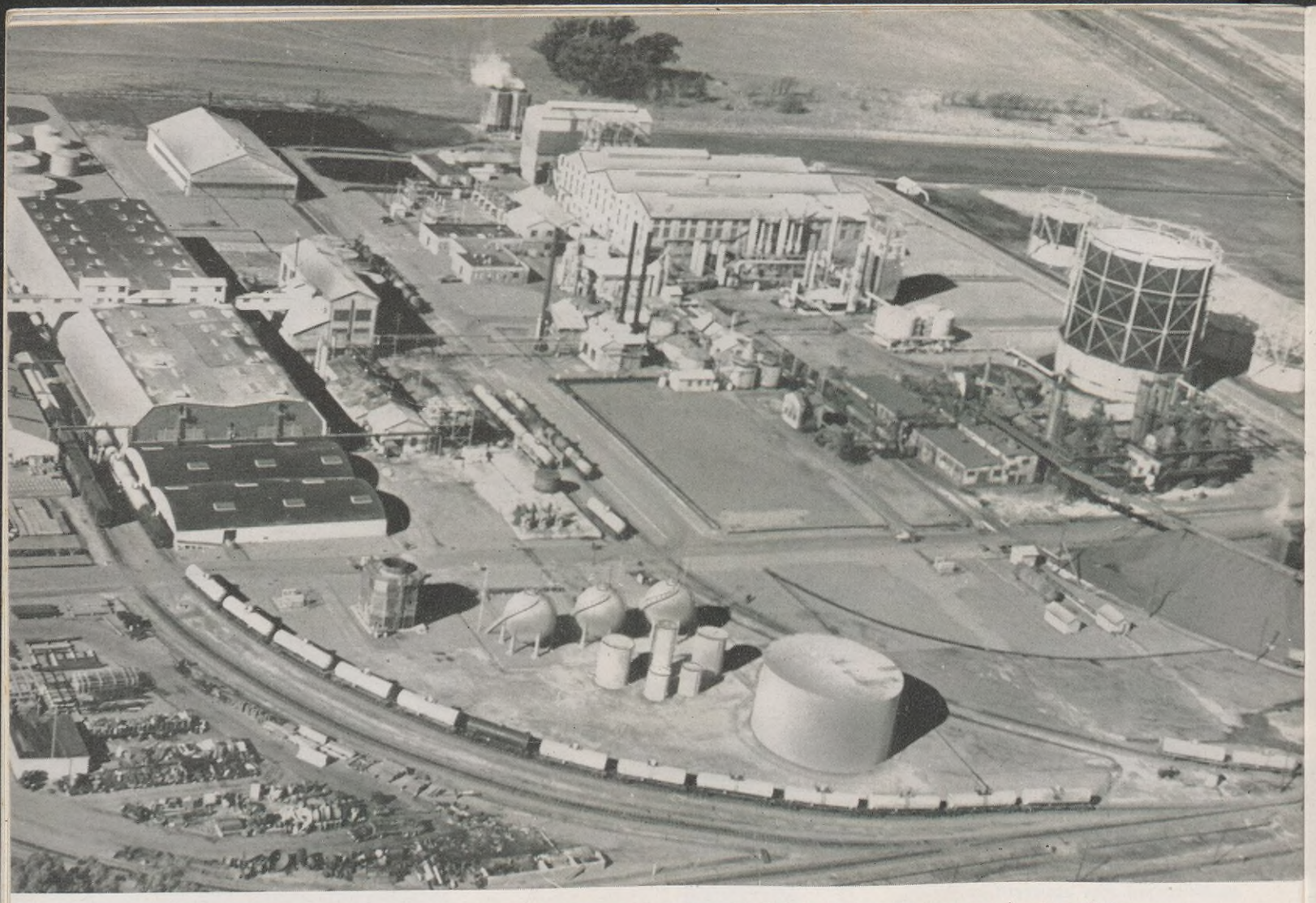
At Shell Point an unprecedented demand for industrial and agricultural ammonia and ammonium sulphate kept that plant running at peak output all year. In fact, the customary late summer seasonal decline in fertilizer consumption failed to materialize. Export demands were particularly strong. As a result of the 1950 experience, installation of additional ammonia manufacturing facilities was begun in early 1951. The increased production which will be possible this year means that the capacity of the



The Torrance Plant, owned by the Reconstruction Finance Corporation, Office of Rubber Reserve, and operated by Shell, was reactivated to supply butadiene for rubber.

The introduction of EPON resins on a commercial scale aided the surface coatings industry. Resin is cooled at Houston (right).

Intensive advertising and sales promotion, some of it like the exhibit at Beaumont, Texas, below helped make 1950 a record year in volume of Shell Chemical product sales.



Unprecedented demands for ammonia and ammonium sulphate kept the Shell Point Plant running at peak output all year.

synthetic ammonia plant will have more than tripled during the last 10 years.

At Martinez, manufacturing facilities were expanded to provide greater quantities and higher quality of Ionol* and other oil additives.

The Shell Chemical Technical Service Laboratory at Union, New Jersey, completed its first full year of operation in 1950. In keeping with its objectives, the laboratory assisted customers in making the best use of Shell Chemical solvents and resins in lacquers, brake fluids, varnishes and enamels. Study of the application of EPON resins in surface coatings was intensified. During the year, the laboratory trained a group of young salesmen from many sales districts in a specially designed course to broaden their knowledge of the various applications of Shell Chemical products encountered daily in the field. In the last quarter of the year the laboratory initiated a continuing study of Shell Chemical products in regard to their optimum use in the nation's military program.

In distribution, improved facilities which mean greater efficiency in transportation and faster service for customers were initiated with the opening of the Argo Marine Terminal at Chicago and additional warehouse facilities throughout the country. The 10-acre, 95,000-barrel terminal in the Chicago suburbs receives bulk products barged from the Houston Plant on inland waterways. Products are then distributed throughout the industrialized Great Lakes region by tank car and truck. Both at the Argo Terminal and at Houston, new facilities installed in 1950 provide for tank truck deliveries of bulk products and enable Shell to keep pace with the current trend of rapid delivery in the chemical industry.

Packaging is another phase of distribution in which Shell Chemical made improvements during the year. In the past, the type of container lining to be used was determined on an individual basis for each product container. Tests made with Shell's own EPON proved it could be used to formulate a single lining for all product containers—and a superior lining at that. Its success in this particular application activated studies for developing EPON formulated liners for containers throughout the oil and other industries.

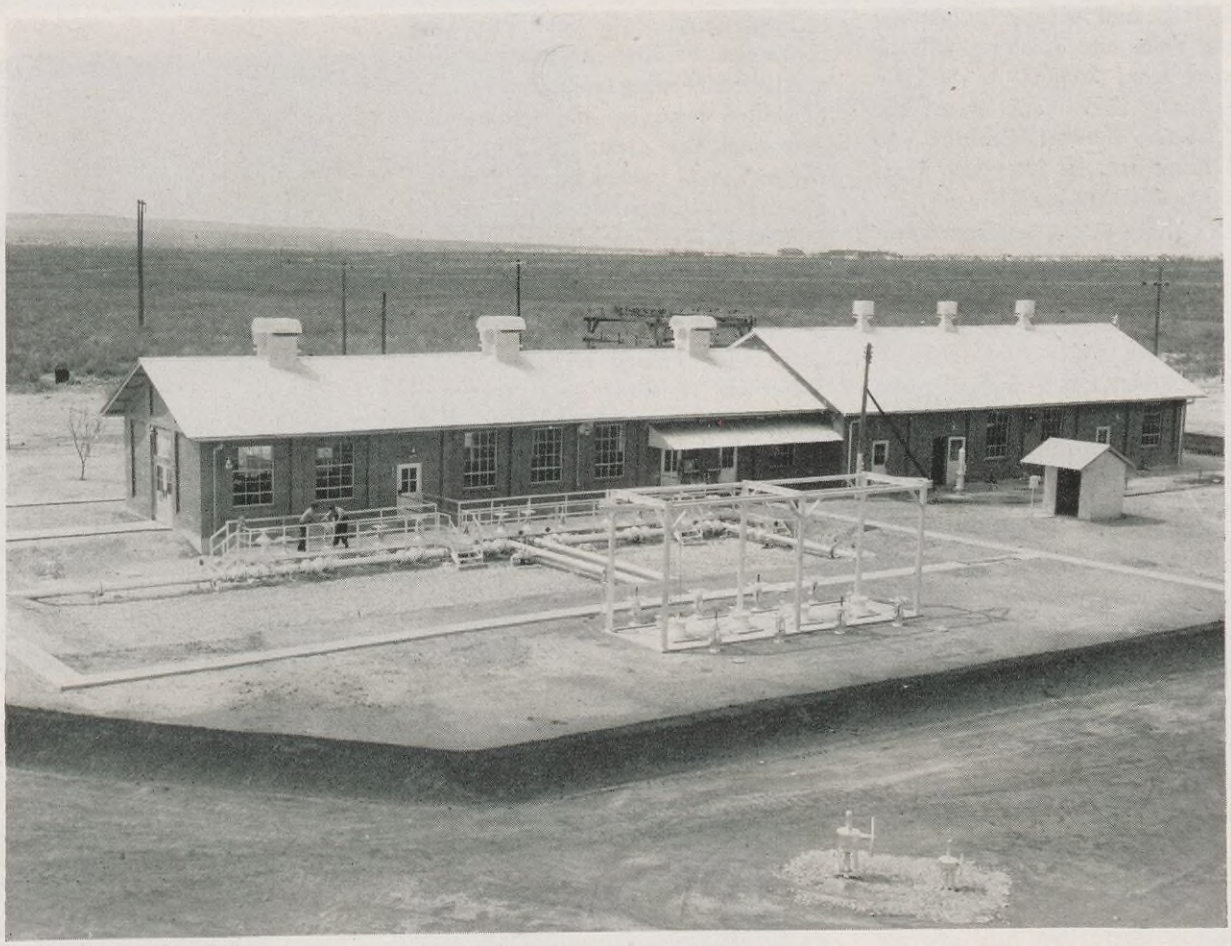
Following a record year for petrochemicals, and in view of rising world demands, Shell Chemical will continue to devote a major effort toward increasing efficiency and quality in its processes and developing new applications to meet the changing requirements of a mobilized economy.

Shell Pipe Line Corporation

IN 1950, with the Basin-Ozark System in its first full calendar year of operation, Shell Pipe Line Corporation transported the largest volume of crude oil and volatiles in its history. But even before the year was out, plans were already underway for the further expansion of these big lines linking Southwest oil fields and Midwest refineries.

A record total of 116 million barrels of liquid was moved during the year. Trunk lines carried the bulk of the total—103 million barrels of crude production and 5.4 million barrels of refined products—while 7.5 million barrels of crude oil were delivered locally from gathering lines. Transporting an average of 298,000 barrels a day for the eighteen shippers it served, Shell Pipe Line's trunk line service established an all-time mark of 52 billion barrel-miles in the twelve month period.

Shell Pipe Line now operates a total of 5,772 miles of trunk and gathering lines of which 4,508 miles are wholly-owned, and 1,264 are jointly-owned in the Basin, Ozark and Bayou Pipe Lines systems. In south Texas, 81 miles of various-sized gas, distillate and products lines were laid during the year to serve the new Provident City gasoline plant and connect it to the Shell Pipe Line system at Sheridan. Another 39 miles of 10-inch line were laid in West Texas to connect the McCamey station with the Kemper station of another carrier for delivery of additional West Texas crude oil to Houston and Baytown refineries. Taken out of service dur-



The McCamey pump station in West Texas was enlarged during the year. The section shown at left serves both the new Kemper line and the older line to Cushing while the section at right serves the line to Houston.

ing the year was a 32-year old, 10-inch "screwed" line extending 438 miles between Cushing, Oklahoma and the Wood River Refinery and 93 miles of gathering and trunk lines laid during the 1930's to serve the now-depleted Dill, Cromwell, Key West, Marshall and Lone Grove fields of Oklahoma.

The last half of the year saw engineering work begin on the new Basin-Ozark System expansion. The project calls for the construction of nine new intermediate booster stations, four on the Basin System and five on the Ozark System, and the modification of nine present stations. Shell Pipe Line personnel will handle the work on the Ozark line.

With the completion of the expansion, the capacity of the Basin System between Colorado City and Wichita Falls, Texas, now 250,000 barrels daily—will be increased to 350,000 barrels daily, and its capacity between Wichita Falls and Cushing will be increased from 265,000 to 385,000 barrels daily. The capacity of the Ozark System between Cushing and Wood River will be increased from 207,000 to 270,000 barrels a day.

Shell's share in the expanded Systems, in terms of daily capacity, will be as follows: from Jal, New Mexico, to Wichita Falls—122,000 barrels; from Wichita Falls to Cushing—131,000 barrels; and from Cushing to Wood River—124,000 barrels. These figures are in addition to the capacities of the parallel older 10-inch lines.

One of Shell Pipe Line's most significant achievements in 1950 was the new low record established in oil handling losses. Despite the greater volume of liquid transported, the barrels lost through system leakage, spillage and evaporation were reduced to the lowest in the last 10 years of operation.

There were notable building improvements. During the summer a small permanent staff of engineers and technicians moved into the new Experimental Engineering Laboratory in Houston where they now provide consulting service to Shell Pipe Line engineering and operating departments. In another move, the Mid-Continent Area office staff, which for 33 years occupied a building located adjacent to the Cushing Tank Farm, was transferred to new quarters in a specially-constructed building in the city of Cushing. And in the West Texas Area, a 23-year old office building was modernized and enlarged to accommodate the Area staff.

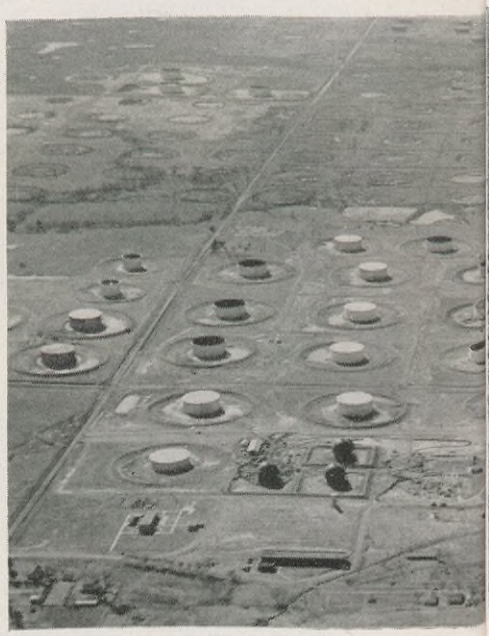
Maintenance was a big item in 1950. The most costly project was the complete reconditioning of 40 miles of 10-inch pipe in the 23-year old McCamey-Houston line near La Grange, Texas. A more dramatic problem, however, occurred early in the year when one of two 22-inch Ozark line sections crossing under the Missouri River parted about 700 feet from the south bank. The work of raising, modifying and rebedding the broken crossing is scheduled for completion early in 1951.

Throughout 1950, Shell Pipe Line continued to help associated Shell companies needing temporary services of skilled engineers and construction personnel. One group of 17 men, for instance, was loaned to the Portland Pipe Line Corporation for several months to serve as inspectors on the construction of that company's new crude oil line from Portland, Maine to Montreal, Canada. Several engineers were loaned to associates in Venezuela to study local crude oil transportation problems, as a result of which there was projected a new 165 mile 30-inch light oil pipe line from Palmarejo across Lake Maracaibo, the mainland and Golfete de Coro to the Paraguana Peninsula. In addition to engineering design work being done in Houston, a group of about 25 engineers and construction experts are now on loan in Venezuela to assist in the actual building of the new line.

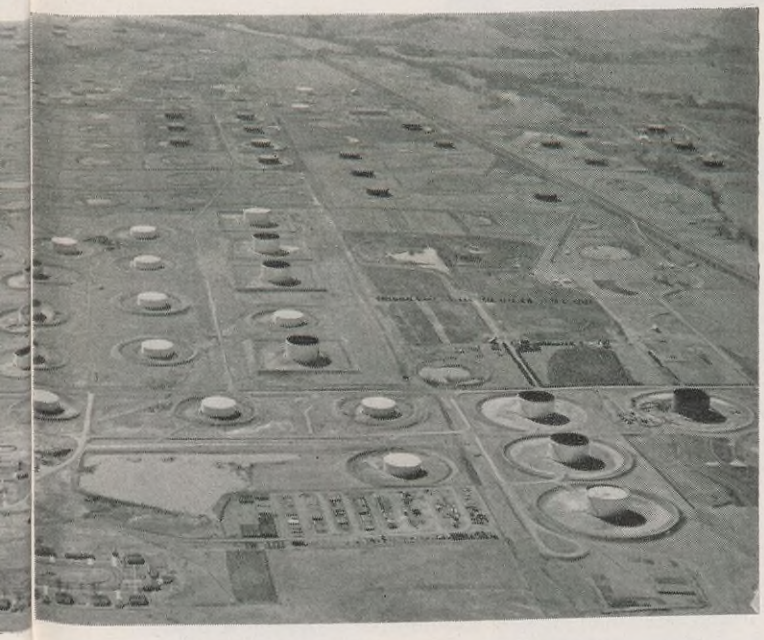
Working almost three million manhours during 1950 with only 3 disabling injuries reported throughout the system, Shell Pipe Line personnel in 1950 improved their already outstanding safety record. Their new mark is the finest in the history of the pipe line industry.

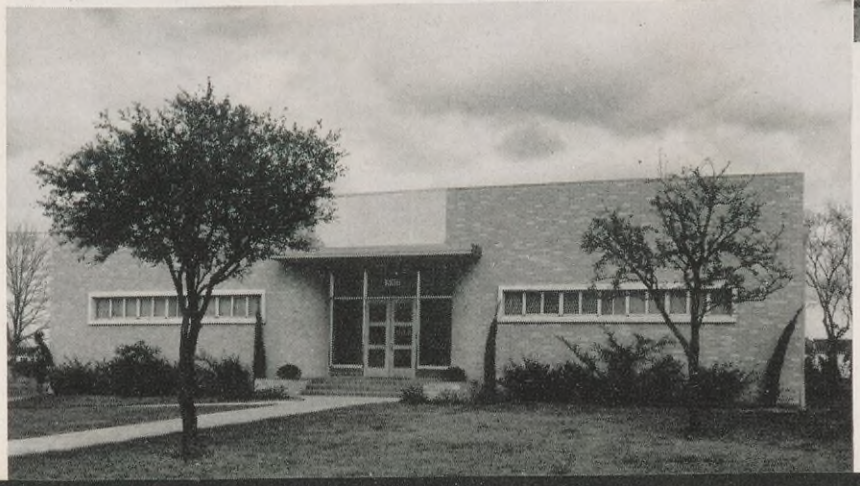
Repair work on the broken section of the Ozark Line's lower Missouri River crossing is scheduled for completion early in 1951. The crossing broke when a record flood-tide scoured out the river bed under the pipe. >

An aerial view of the tank farm at Cushing, Oklahoma, junction of the Basin and Ozark Pipe Line Systems where crude oil transported in the Basin and Elk City lines flows into the Ozark Line.



The new experimental laboratory in Houston serves as consultant for Shell Pipe Line engineering and operating departments. >





Connecting the Elk City field with the Basin-Ozark System, the Elk City-Cushing line went into full service early in 1950.

Photograph by Karsh

MR. FRASER RETIRES

ALEXANDER FRASER, Chairman of the Executive Committee of Shell Oil Company, retired March 31st.

Mr. Fraser's career with Shell goes back more than thirty years during which time he played a leading role in the development and success of the Company. After holding various executive positions he became President of Shell Petroleum Corporation in the depression year of 1933. Inspired by his leadership, the Company moved steadily forward in spite of the intense, and at times destructive, competition which characterized the oil industry in the thirties.

In 1939 when the Shell operating companies on the Atlantic and Pacific coasts and in the Middle West were merged into a single company, Mr. Fraser became its President. In 1947 he became President of Shell Union Oil Corporation and two years later, on its consolidation with Shell Oil Company, Inc., he was elected Chairman of the Executive Committee.

Mr. Fraser is a native of Glasgow, Scotland. His first job was with the Pumpherston Oil Company, one of the pioneers in Scotland's shale oil enterprises. In 1910, a new association with the General Asphalt interests took him to the Trinidad and Venezuela oil fields and later he came to that Company's head office in Philadelphia.

During World War I, Mr. Fraser served as Secretary of the Inter-Allied Petroleum Council, with headquarters in London. The war over, he returned to the United States where he joined Shell.

Mr. Fraser has been a leader in the oil industry and the business world generally, as well as in the Company. He is a director of the American Petroleum Institute, past president of the 25 Year Club of the Oil Industry, and former chairman of the Automotive Safety Foundation. He is also a member of the Institute of Mining and Metallurgical Engineers, a member of the National Industrial Conference Board and a former director of the Western Petroleum Refiners Association.

He has always given freely of his time to civic, church and charitable organizations and has participated actively in fund drives for worthy organizations both in St. Louis and New York.

SHELL NEWS, speaking for the thousands of Shell employees who know and respect him, extends to Mr. Fraser best wishes for many years of happy retirement.

Service Birthdays

Thirty-Five Years

L. A. MASSEY
Tulsa Area
Production

Thirty Years

JOSEPH BELLATO
Martinez Refinery
Engineering

L. J. GROSSHEIM
Houston Refinery
Fire & Safety

W. J. KINLER
Norco Refinery
Personnel & Ind. Relations

H. A. PETTIT
Norco Refinery
Treating

R. H. SALES
Houston Area
Gas

A. C. SAUL
San Francisco Office
T. & S. Manager

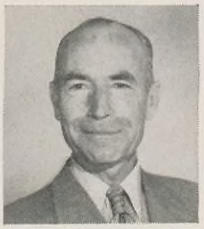
J. E. SIMPSON
Tulsa Area
Production

R. N. WITHERS
Tulsa Area
Production

Twenty-Five Years

F. V. ALMOND
Shell Chemical Corp.
Shell Point Plant

J. W. BOSWELL
Wood River Refinery
Research Laboratory



R. D. BOYLAN
Wilmington Refinery
Catalytic Cracking

W. A. CARNAHAN
Head Office
Treasury

G. W. CARSTENS
Wood River Refinery
Engineering

E. J. CHAISSON
Norco Refinery
Engineering

T. M. COLLINS
Martinez Refinery
Compounding

R. V. CONOVER
Shell Pipe Line Corp.
Bayou System

F. L. DOVER
Cleveland Division
Operations

B. DYKSTRA
New Orleans Area
Manager

K. F. FISHER
Cleveland Division
Operations

C. E. FRANCIS
Martinez Refinery
Research Laboratory

H. J. GOMEZ
Norco Refinery
Engineering

E. F. HICKMAN
Los Angeles Reg. Office
Treasury

L. H. JACKSON
Los Angeles Basin Div.
Production

P. J. JACOB
Norco Refinery
Engineering

T. L. JUDY
Shell Chemical Corp.
Shell Point Plant

H. M. KAY
Wood River Refinery
Cracking

SAMUEL LARSON
Martinez Refinery
Engineering

M. C. LAWTON
San Joaquin Division
Production

S. S. LORENZ
Shell Pipe Line Corp.
Mid-Continent Area

R. T. LUDEWICK
Tulsa Area
Automotive

A. G. MacDONALD
Seattle Division
Treasury

C. C. McGUIRE
Atlanta Division
Sales

E. R. MEEKS
Houston Refinery
Cracking

S. H. MORPHEW
Shell Pipe Line Corp.
Mid-Continent Area

C. F. OGLESBY
Wood River Refinery
Compounding

J. P. O'KEEFE
Head Office
Treasury

G. C. POPP
Chicago Division
Operations

G. L. PRATT
Los Angeles Division
Operations

J. W. PUCKETT
Portland Division
Marketing Service

G. C. RALLS, Martinez Refinery, Engineering
G. S. REDMAN, Seattle Division, Operations
W. C. REYNOLDS, Products Pipe Line, East Chicago, Ind.
J. N. SANGUINETTE, St. Louis Division, Marketing Service
E. H. SCHNARRE, Products Pipe Line, Sibley, Illinois
V. I. SCROGGS, Shell Pipe Line Corp., Mid-Continent Area
E. T. SIMONEAUX, Norco Refinery, Engineering

B. A. SNAER, Los Angeles Division, Treasury
A. J. SYDENSTRICKER, Martinez Refinery, Cracking
R. W. TABOR, Seattle Division, Sales
G. D. TAYLOR, Tulsa Area, Gas
D. A. WILSON, Products Pipe Line, Waltham, Mass.
C. WINETEER, Wilmington Refinery, Engineering
T. YOUNG, Wood River Refinery, Engineering

SHELL OIL COMPANY

Head Office

10 Years

Helen C. Petrie ..... Trans. & Supplies
Frances M. Steinbach ..... Trans. & Supplies

Exploration and Production

HOUSTON REGIONAL OFFICE

15 Years

G. H. Calhoun ..... Production

HOUSTON AREA

20 Years

C. P. Bristol ..... Production
F. G. Newman ..... Gas
D. C. Robertson ..... Production

15 Years

H. H. Lester ..... Exploration
H. D. Parks ..... Production
A. D. Tinker ..... Production

10 Years

J. E. Doffing ..... Land
W. L. Jungers ..... Exploration
K. F. Pilgram ..... Production

MIDLAND AREA

15 Years

J. M. Nuttall ..... Land
W. A. Simpson ..... Production

10 Years

L. C. Allen ..... Production
C. M. Marsden ..... Production
C. W. Summers ..... Treasury

NEW ORLEANS AREA

15 Years

C. J. Boudreaux ..... Production
L. W. Guidry ..... Production
C. A. Landry ..... Production
R. E. McKague ..... Production
J. L. Robbins ..... Production

10 Years

G. O. Broussard ..... Production
A. E. Campbell ..... Production
J. R. Drackett ..... Production
M. W. Gray ..... Production
C. R. Koger ..... Production
J. K. Larsen ..... Exploration
C. A. Lucas ..... Purchasing-Stores
G. W. Wynn ..... Production

TULSA AREA

20 Years

E. C. Botner ..... Production
H. J. Hesp ..... Treasury

15 Years

J. L. Collins ..... Production
G. M. Dressel ..... Production
R. E. McAdams ..... Exploration
J. F. Redmond ..... Production
E. R. Shorey, Jr. ..... Production
J. W. Timothy ..... Exploration

10 Years

P. V. Bryant ..... Production
R. E. Holloway ..... Production
L. R. Hulsizer ..... Production
J. A. McCormick ..... Crude Oil
D. C. McCoy ..... Production
G. C. Meyer ..... Production
E. C. Moody ..... Exploration
R. F. Wicks ..... Production
J. D. Wilcox ..... Production

LOS ANGELES REGIONAL OFFICE

10 Years

Katherine Southwick ..... Land

COASTAL DIVISION

10 Years

F. M. Wilson ..... Purchasing-Stores

LOS ANGELES BASIN DIVISION

15 Years

J. N. Gregory ..... Administration

10 Years

R. W. Allee ..... Production
J. H. Hammond ..... Exploration

PIPE LINE DIVISION (Calif.)

10 Years

C. C. Galbreath ..... Production
H. B. Lemaire ..... Production
H. Van Sheets ..... Production

ROCKY MOUNTAIN DIVISION

15 Years

W. C. Finch ..... Exploration

10 Years

L. F. Schombel ..... Exploration

SAN JOAQUIN DIVISION

20 Years

A. M. Belden ..... Production

10 Years

F. R. Hoesley ..... Exploration

EXPLORATION & PRODUCTION RESEARCH

15 Years

A. J. Hermont ..... Physical

Manufacturing

HOUSTON REFINERY

20 Years

W. R. Carter ..... Engineering
W. O. Hopper, Jr. ..... Control Laboratory
B. R. Powell ..... Engineering

10 Years

B. E. Bailey.....Engineering
J. F. Bowley.....Stores
C. C. Hyatt.....Cracking
P. P. Phillips.....Lubricating Oils
A. V. Rowland.....Engineering

MARTINEZ REFINERY

15 Years

D. H. Neilson.....Research Laboratory
O. D. Phelps.....Cracking

10 Years

C. Q. Bonavera.....Compounding
W. L. Buchanan.....Engineering
E. A. Fauth.....Engineering
E. C. Ford.....Dispatching
F. S. Lucido.....Dispatching
D. F. Sanfilippo.....Engineering
W. Stanley.....Compounding

NORCO REFINERY

20 Years

W. F. Gubert, Jr.....Engineering

15 Years

H. A. LeBlanc, Jr.....Engineering

10 Years

M. J. Clark.....Distilling
J. E. Englade.....Engineering
H. T. Gaudet.....Distilling
N. J. Schexnayder.....Engineering

WILMINGTON REFINERY

20 Years

F. T. Bennett.....Engineering
J. J. Carl.....Engineering
J. T. Toner.....Engineering
R. M. Wallace.....Engineering

15 Years

R. E. Lees.....Engineering
A. T. Zamora.....Catalytic Cracking

10 Years

C. M. Branson.....Engineering
E. R. Bumgarner.....Engineering
L. H. Hamilton.....Effl. Cont'l & Util.

WOOD RIVER REFINERY

20 Years

R. T. Coale.....Cracking
L. Dillow.....Engineering
B. Tyler.....Cracking

15 Years

E. M. Ahrens.....Stores
D. D. Dittes.....Distilling
G. K. Dycus.....Control Laboratory
C. P. Hackethal.....Control Laboratory
J. A. Hmurovich.....Engineering
A. J. Losch.....Dispatching
H. M. Lurton.....Research Laboratory
G. W. Norder.....Compounding
C. A. Pickering.....Lubricating Oils
R. V. Quakenbush.....Lubricating Oils
J. M. Sones.....Cracking
E. L. Sooy.....Cracking
G. J. Turnbeaugh.....Alkylation

10 Years

J. H. Becker.....Cracking
G. Bednar.....Dispatching
M. E. Bekeske.....Control Laboratory
L. E. Bethards.....Treasury
D. W. Carroll.....Engineering
H. L. Cotter.....Treating
J. W. Hanvey.....Dispatching
A. H. Hommert.....Cracking
R. M. Laumbattus.....Lubricating Oils
D. R. Linn.....Gas
C. C. Mayfield.....Engineering
L. L. McCormick.....Cracking
R. M. Miller.....Lubricating Oils
K. E. Nail.....Cracking
R. J. Nuernberger.....Utilities
R. C. Ruff.....Cracking
E. C. Schneider.....Lubricating Oils
H. I. Schroeppel.....Dispatching
S. S. Seiberlich.....Distilling
M. C. Sickbert.....Dispatching
H. A. Sparling.....Cracking
C. B. Stark.....Cracking
J. T. Steiner.....Dispatching
B. B. Trousdale.....Distilling
M. W. Tucker.....Cracking
R. Watson, Jr.....Cracking

Marketing Divisions

20 Years

F. E. Dutilh.....Atlanta, Operations
J. A. Tetlow, Sr.....Atlanta, Operations
P. L. Friend.....Boston, Operations
W. E. Boyd.....Los Angeles, Operations
W. E. Pullwitt.....New York, Operations
R. B. Allen.....Portland, Treasury
A. L. Schneider.....Sacramento, Operations

15 Years

J. B. Ellers.....Albany, Sales
Loretta Morin.....Minneapolis, Sales
R. T. Sorensen.....Portland, Marketing Service
A. L. Cuneo.....Sacramento, Sales
W. H. Hadley.....Sacramento, Sales
F. T. Hall.....St. Louis, Operations
S. G. Johnson.....San Francisco, Sales
J. W. Cobb.....Seattle, Sales
R. G. Eklow.....Seattle, Sales
G. H. Paulson.....Seattle, Operations
Agnes M. Reagan.....Seattle, Treasury
R. G. Smith.....Seattle, Sales

10 Years

M. C. Jones.....Atlanta, Operations
J. B. Moore.....Atlanta, Marketing Service
H. H. Waterhouse.....Boston, Treasury
P. J. Koepp.....Chicago, Operations
O. G. Schneider.....Chicago, Sales
R. J. Thirion.....Chicago, Operations
E. J. Ward.....Chicago, Sales
J. J. Reck.....Indianapolis, Operations
J. E. Malley.....Los Angeles, Operations
C. A. Phillips.....Los Angeles, Operations
P. R. Studer.....Los Angeles, Operations
M. B. Wilson.....Los Angeles, Operations
F. S. Naughter.....Minneapolis, Operations
Cora V. Olson.....Minneapolis, Treasury
D. Bernardo.....New York, Operations
A. Hauser.....Sacramento, Operations
J. K. Dickie.....San Francisco, Operations
E. O. Honey.....San Francisco, Operations
G. J. Owens, Jr.....San Francisco, Operations
R. C. Hadlock.....Seattle, Operations
B. L. Hill.....Seattle, Operations

Products Pipe Line

10 Years

J. O. Awalt.....Lima, Ohio
C. L. Cooper.....Holliston, Mass.
W. J. Kacsock.....Holliston, Mass.
V. E. Nicholas.....Lima, Ohio
A. F. Rose.....Holliston, Mass.
V. C. Scarano.....Holliston, Mass.
G. E. Spangler.....Lima, Ohio
L. P. Whitson.....Terre Haute, Ind.

Sewaren Plant

20 Years

J. W. Howell.....Compounding
J. Kara.....Compounding

15 Years

J. E. Jensen.....Terminal
J. Kovacs.....Compounding
R. T. Leisen.....Compounding
N. Markow.....Compounding
W. A. O'Connor.....Compounding

10 Years

D. A. Cosgrove.....Depot
S. J. Lomonico.....Depot
S. R. Mitzak.....Treasury
F. D. Waitt.....Terminal

SHELL CHEMICAL CORPORATION

20 Years

E. E. Bamrud.....Shell Point
J. J. Ford, Jr.....Houston
C. L. Hedman.....Western Division

15 Years

E. F. Eckman.....Head Office
A. N. Holcombe.....Shell Point
K. C. Luberg.....Torrance
R. M. Pierce.....Dominguez
R. J. Rushton.....Martinez
W. S. Vickers.....Dominguez

10 Years

S. H. Edison.....Martinez
A. W. Fleer.....Head Office
R. E. Jackson.....Houston
I. E. Norden.....Shell Point
L. R. Parker.....Dominguez
J. F. Sanchez.....Shell Point
E. H. Waugh.....Dominguez

SHELL DEVELOPMENT COMPANY

15 Years

H. Diamond.....Lubricants & Fuels
G. A. Nelson.....Development Division

10 Years

T. B. Carrington.....Motor Laboratory
Elizabeth M. Cathcart.....Development Division
R. M. Estep.....Service Engineering

SHELL PIPE LINE CORPORATION

20 Years

A. C. Webb.....Bayou System
W. E. Yates.....Texas-Gulf Area

15 Years

F. F. Allgaier.....Bayou System
W. L. Fuller.....West Texas Area
S. M. Manning.....Texas-Gulf Area
M. C. O'Neal.....West Texas Area
W. A. York.....Mid-Continent Area

10 Years

F. W. Bell.....Mid-Continent Area
F. H. Cummins.....Mid-Continent Area
B. A. Funk.....Head Office
A. L. Langley.....Mid-Continent Area
J. P. Miller.....Mid-Continent Area
A. L. Smith.....Texas-Gulf Area

matters of *Fact*

Progress Adds Up

Ours is a young and fast growing Company engaged in a highly technical and competitive business. In order to maintain our competitive position we must constantly search for new oil fields and develop new products and processes, and expand our markets. Every year this calls for a tremendous outlay for new plants and equipment. Shell made capital expenditures amounting to $86,000,000 in the year 1950 and more than *half a billion dollars* during the last five years.

SHELL OIL COMPANY
50 West 50th Street
NEW YORK. N. Y.
RETURN POSTAGE GUARANTEED

Elliott W. Marsh
510 E. Union St.
Olympia, Wash.

G

1950 was another progressive year in Shell's modernization and expansion program. Among the many units that went into operation in 1950, six appear on this page.

1 Shell Development Company's new building at Emeryville, California.

2 New Epon production facilities at the Houston Chemical Plant.

3 "Cinderella" Well No. 1, on Longwood Plantation, Burtville, Louisiana.

4 A view of the Sulphonate Plant at the Martinez Refinery.

5 Shell Pipe Line Corporation's new Area Office Building, Cushing, Okla.

6 Expanded bulk storage and distribution facilities at Mount Vernon, N. Y.