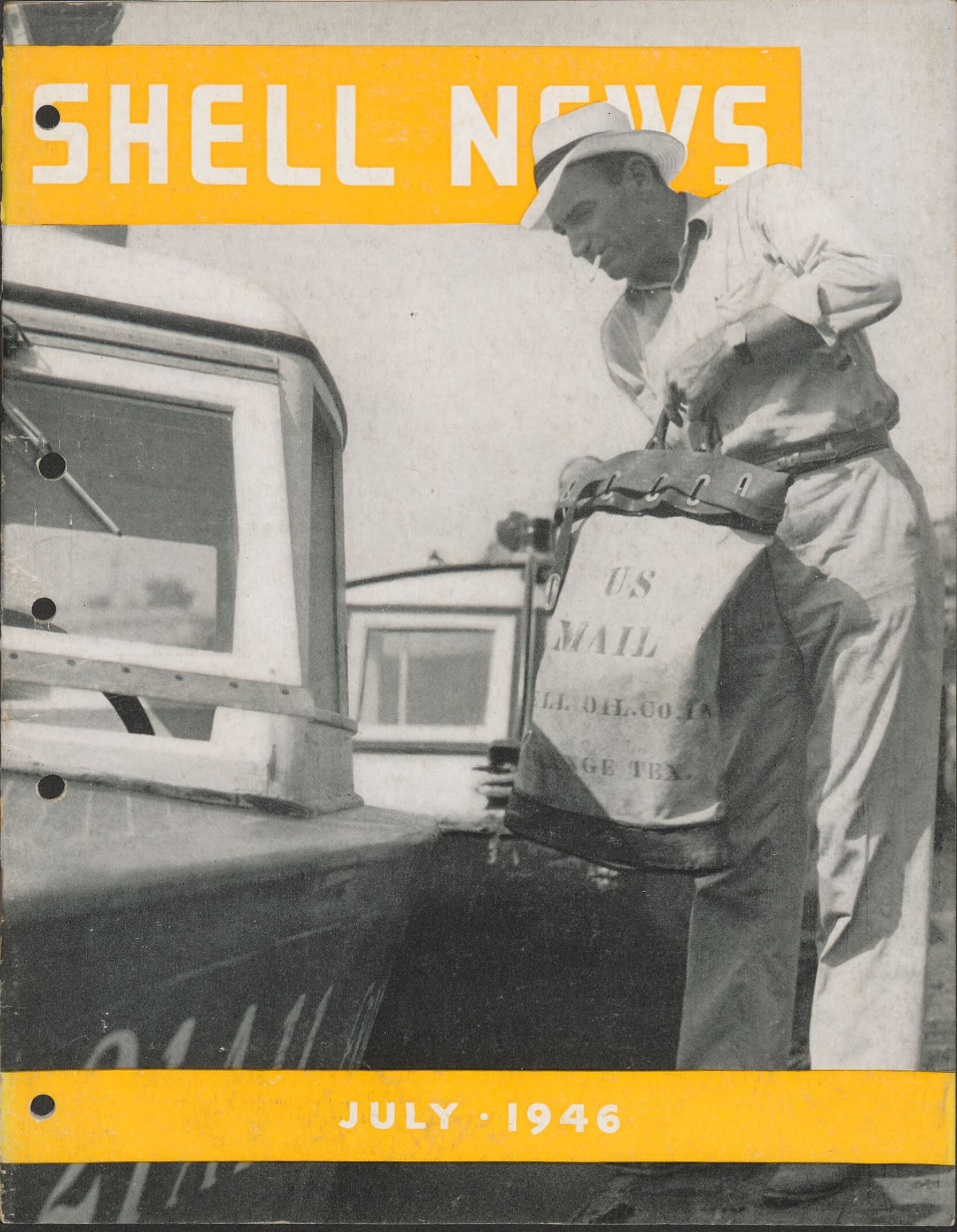
SHELL NEWS



JULY · 1946

matters of Fact

926

Shell employees have retired on pension since the plan was established in 1938.

$6,500,000

has been set aside in a reserve fund to provide those 926 pensions.

AN ADDITIONAL

$30,250,000

has been provided toward pensions for employees who will retire in the future. This amount is being added to each year.

SHELL NEWS

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

JULY • 1946 VOL. 14 • No. 7

• Contents •

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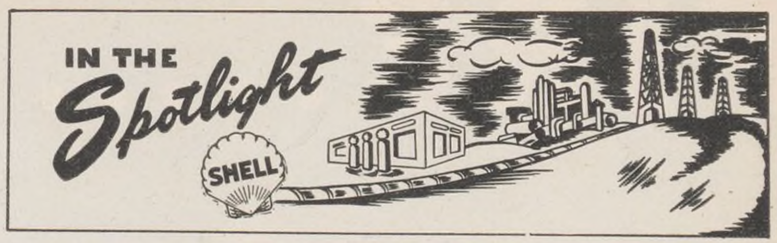
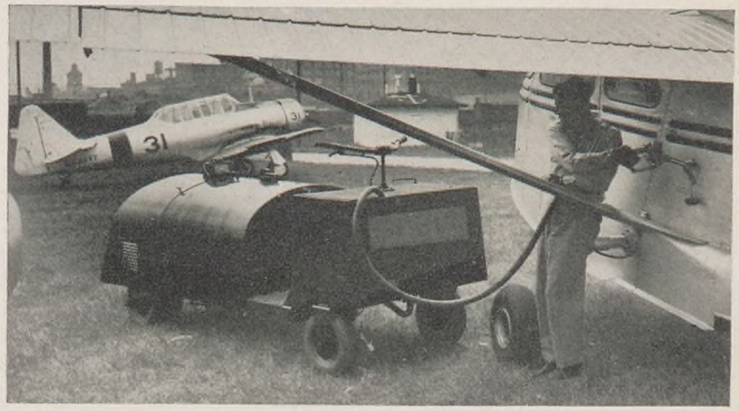




Pictured above is the newest addition to the Shell Oil family . . . a newcomer which will be welcomed warmly by airport and aircraft operators throughout the country.

Named the Beaver the new item is an aviation refueling unit especially designed for the servicing of light aircraft. Experimental models are already in actual use and full scale production of the final design is expected shortly.

Testing ground for the new refueler is the Republic Aviation Corporation plant at Farmingdale, Long Island, home of the famous P-47. Republic is now concentrating on the See-Bee, a light 4 seater, personal type plane and it is for this type plane that the Beaver is especially suited.

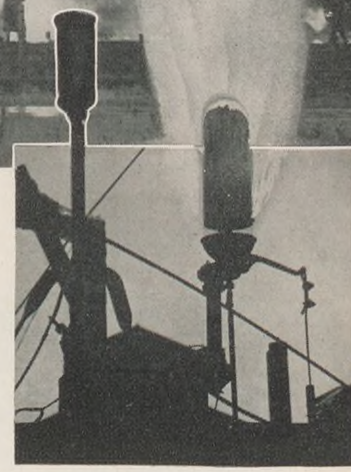
In the vital statistics department: The self-powered unit is a streamlined refueler in the familiar yellow and red colors. With a tank capacity of 150 gallons it will pump fuel at a maximum rate of 25 gallons per minute. Powered by a 5 horsepower, one-speed gasoline engine, it is capable of doing 8 miles per hour in either forward or reverse. The pump is operated by a power takeoff from the motor. The forward compartment contains a 12 foot hose on a spring-loaded reel complete with safety nozzle. Space is also provided for two cases of oil and miscellaneous equipment.

The Beaver will replace or supplement other equipment in the servicing of light planes. As it will make taxiing to pumps unnecessary it will greatly increase airport efficiency. Of course, trucks will still be used in the fueling of heavier planes as these require larger quantities and a faster rate of supply.

Use of this new refueling unit will effect a great saving in both initial investment and in upkeep. Operating cost is negligible and smoother all-around airport operation is achieved.

Front Cover: Power boat pilot C. T. Rogers makes daily mail run into Orange, Texas, from Black Bayou.

FIRE.....



by R. A. Randels, Chief Fire and Safety Inspector, Wood River Refinery

The development of fire protection has matched, step by step, the growth of the petroleum industry. Typical of this progress is Shell's modern fire protection program at Wood River.

THE spectacular photo shown above was taken at the Wood River Refinery in 1941. At 9 A.M. on May 14, tank A-16 was set ablaze by lightning and the fire was finally extinguished at 6 o'clock the following morning. At the time of the photograph the fire was at its height and a "boilover" was in progress. An 80,000 barrel tank, A-16 contained approximately 68,000 barrels of crude oil, at the time of the fire. The over-all cost of this blaze was roughly $111,000.

Petroleum fires, like all fires, require the presence of fuel, oxygen and a source of ignition. Without these three requisites no fire can exist; hence, fire-fighting techniques have always been based on removing one or more of them. The elementary means of fire-fighting are cooling, smothering and starving. Because of the characteristic properties of each of the many finished products of petroleum, many different fire-fighting techniques are necessary for maximum efficiency in the control and extinguishment of a blaze.

In regard to inflammability, the two most pertinent properties of oils are volatility and viscosity. Volatility influences the tendency of a liquid to vaporize, and viscosity is the consistency of a liquid which determines the speed at which it will flow. Gasoline, a highly volatile liquid, will vaporize readily at normal temperatures. Conversely, fuel oils, lubricating oils, and asphalt are low volatility products and require heat to vaporize. The term "flash point" which is mentioned frequently in connection with oils is the lowest temperature at which the specific oil will evolve sufficient vapors to ignite in the presence of flame. Gasoline which vaporizes easily is said therefore to have a low flash point.

The viscous property of oil is important in that it indicates the speed with which a fire can spread. Kerosene with a low viscosity will flow and spread fire more rapidly than the highly viscous asphalt.

Oil fires vary greatly, depending upon the type of oil which is afire. In the case of a small fire, water may quench the blaze by reducing the temperature and snuffing out the flame. Fog or a water spray which will tend to froth the surface and thus choke off the air supply is effective in some cases. Steam is sometimes preferable when a sufficient amount can be supplied to dilute the vapor-air mixture and render it incombustible. The action of steam when applied to fires is primarily a "smothering" action and therefore steam is most efficient in combatting fires in small, enclosed places. Foam is especially desirable in fighting oil fires as its action is twofold. It tends to cool the burning mixture and, more important, "starves" the blaze by blanketing the oil surface, thus preventing the formation of combustible vapor.

At its Wood River Refinery, Shell has developed an extensive fire protection program, the results of which are evident in the refinery's excellent fire record. The problem of fire protection is approached from three angles. The first and most important approach is fire prevention, or the elimination of potential fire hazards. The second is a well-trained fire crew. The third is good fire-fighting equipment and facilities.

Fire prevention really begins with the original planning and layout of a refinery. Protection is actually built into its installations. All permanent buildings are constructed of materials that will resist fire. Pump and compressor houses have special ventilating devices to keep the air clear of explosive vapors. Buildings and structures which may at times be exposed to inflammable gases utilize electrical equipment constructed with that hazard in mind. Tanks and certain attached equipment are also designed for a maximum of safety. Large tanks are placed on concrete rings in order to prevent the addi-

Proving Grounds for newest methods of fire extinguishment.

30 x 30 pit of No. 3 fuel oil topped with two barrels of gasoline one minute after ignition.

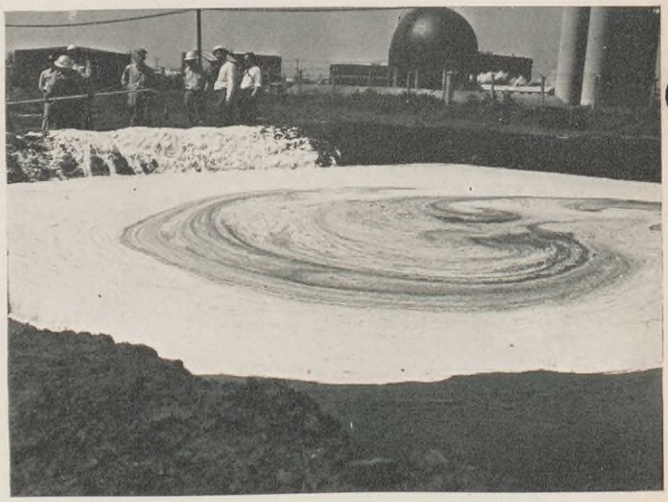
Fire crews go into action with two fog nozzles.

Fire's extinguished . . . and the time . . . 24 seconds.

The pit is re-ignited.

This time fire crews apply chemical foam.

After 64 seconds of fire fighting. . . .



The blaze is snuffed out by the foam "blanket".

tional strain on tank walls caused by settling. Those containing highly inflammable products are encircled by retaining fire walls or isolation walls. All piping, fittings and valves are constructed of stout steel with provision made for expansion, contraction and vibration. Pipes which discharge into trucks or tank cars are carefully grounded to prevent accidental sparks.

The fire-prevention program at Wood River embodies certain rules and regulations. An educational program to acquaint personnel with these rules and their enforcement is constantly in progress. The program is handled by the Fire and Safety Department, a group of seven senior inspectors under the direction of the Chief Fire and Safety Inspector. At meetings fire hazards in individual units are pointed out and discussed with operators working in those sections. Smoking is, of course, strictly forbidden within the Refinery gates.

Furthermore, there are a number of special operating procedures, based on years of experience, which ensure safe and efficient operation of the plant. Before a craftsman is allowed to work on lines, vessels or other operating facilities he must obtain a written permit from the Fire and Safety Department. First the department's staff investigates the equipment and surrounding conditions. They then take whatever precautions are deemed necessary, such as covering all open sewers, isolating the equipment with blinds and removing any spilled oil or explosive mixtures which may be present. Then the inspector checks conditions and if satisfied, issues the permit.

Oil and gas leaks, once discovered, must be repaired immediately or brought under control with steam smothering or other methods. A definite procedure is established for the lighting of oil and gas burners for boilers and furnace operation and for tank gaging. Gasoline powered machinery such as locomotives, trucks and cranes are excluded from operating areas and loading racks unless special permission is granted. The potential hazard of escaping gas is constantly impressed upon all employees and they are continuously drilled in its control.

Another important function of the Fire and Safety Department is the training of 12 fire crews for each shift. Almost 2,000 Wood River employees have received training in fire fighting. Members of fire crews are taken from various operating departments and are selected according to the positions they hold. Training sessions are held daily and the crews rotated, so that they receive a refresher course on an average of once a month. Each crew consists of a captain, driver and nozzleman, and hydrantman. In addition to the regular training sessions the crew captains gather every month for extra instruction in the use of special equipment such as fog nozzles, adapters and personal protective apparatus. Every operator is trained to use certain equipment which is set up throughout the refinery—the sprinkler systems, turret nozzles and quick-acting hose reels. In the event of an alarm sounded by the fire whistle, these crews report to their appointed stations.

Maintenance is another well-developed aspect of fire protection. This is aided by the Inspection Department, a group of 20 trained men. During shutdowns they look over each refinery unit with an eye to weakness or loss of metal by corrosion. Accurate records are kept of all tubular equipment, pumps, pressure vessels and selected fittings. Thus the department is able, through periodic checkups, to determine the approximate life of equipment and avoid breakdown. Craftsmen check various instruments and machine accessories. At the same time a regular lookout is kept for the arcing or overloading of electrical equipment. Certain tank fittings such as flame arrestors, vents and screens are inspected every month to insure tank protection. Tanks are checked regularly as to the strength of roof and side walls. Breakage and leaks are repaired as soon as possible to minimize the hazard.

Fire fighting equipment is the third essential of any fire protection program and the system at Wood River is modern in all respects. The high pressure water system at Wood River, powered by 3 centrifugal pumps, delivers 4,500 gallons per minute at 175 pounds per square inch. The lines are so arranged that water may be directed upon any operating area from three directions, thereby practically eliminating the disastrous possibility of water failure. The water supply at Wood River was planned independently of local water plants and fire departments. These could supply only a small fraction of the aid needed in the event of a conflagration.

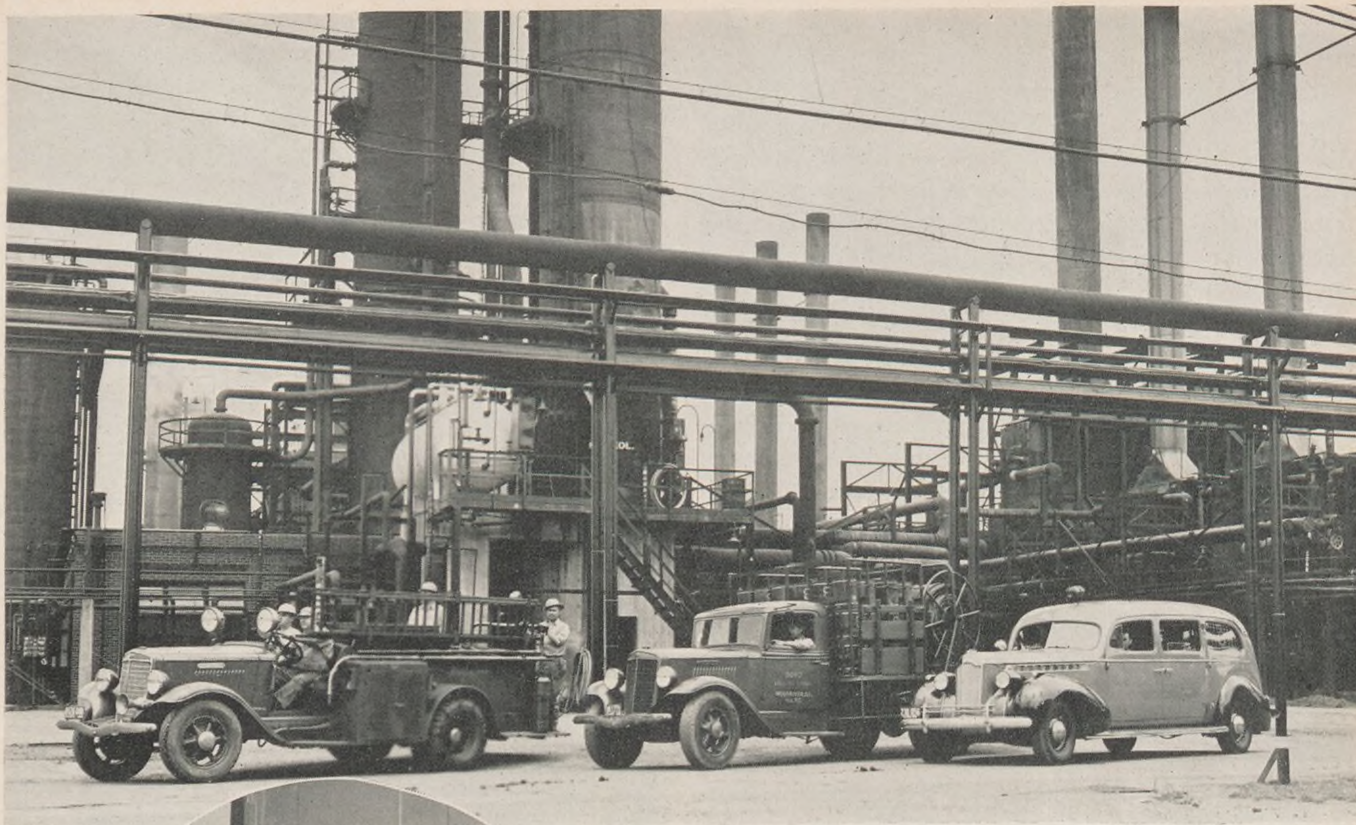
The centrifugal pumps draw water from storage tanks which are supplied by electrically-driven wells. Four of these wells are also equipped with gasoline engines and, in the event of a power failure, can continue to deliver 2,000 gallons of water per minute. At the barge-loading docks on the nearby Mississippi are facilities to supply 1,100 gallons per minute from the river. The gasoline-driven pump which delivers this water also is part of the dock fire protection facilities and furnishes water to turret nozzles located at points along the wharf.

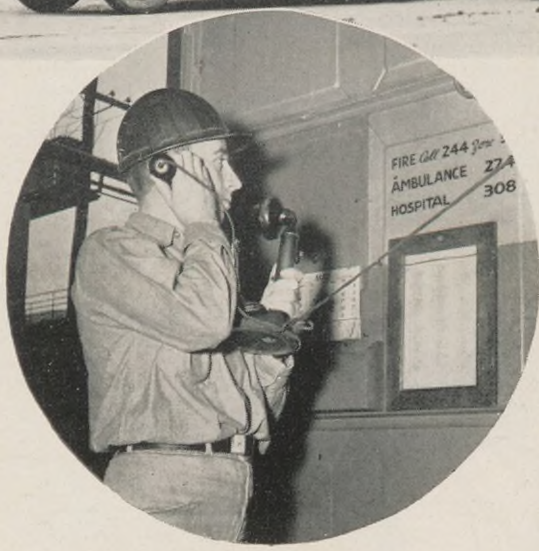
In a matter of minutes, 2,700 feet of hose is carried by special truck to any fire as soon as the alarm sounds. Hose connections are situated so that they are within easy reach but not so close as to be affected by the fire. In all cases, the water hydrants are equipped with nozzle valves and wrenches.

Two widely used extinguishing agents for oil fires are available at Wood River . . . water fog and chemical foam. The former is effective because of its cooling and blanketing action.

Foam is divided into two types—the "wet" foamite and the "dry" or powder type. These differ only in the manner and form in which they are stored and applied. In the wet or foamite system the two compounds, A and B, which combine to produce foam, are stored in solution in two separate tanks. From these tanks dual pipe lines run to potential danger points throughout the refinery. Here they enter mixing chambers and unite to form foam. At Wood River 75,000 gallons of each solu-

Turret nozzle at catalytic cracking plant. Top of the stream is 200 feet above ground level.





(Above) Rolling equipment which answers all fire alarms. Fire truck, hose truck and ambulance.

(Left) Phoning in an alarm. Emergency numbers are prominently displayed to avoid confusion and loss of precious time.

tion is available with additional chemicals on hand to recharge the system. Some 14,950 feet of 1½-inch foam hose is apportioned through the refinery with an extra 1,250 feet on hand in the central warehouse. This foamite system is connected to all operating units as well as to a number of tanks. Foamite storage tanks are gaged weekly and their contents are analyzed monthly to determine if any deterioration has taken place. The piping and pumping facilities of this system are also subject to periodic check-up.

Under the dry system the chemicals are stored in powder form at vantage points throughout the refinery. In case of fire the A and B powders are mixed with water in a foam generator and produce foam on the spot. Wood River is equipped with twelve of these portable foam generators and maintains a supply of 90,000 pounds of each powder. An additional 200,000 pounds is stored in the vicinity so that the refinery may have easy access to it in the event of a major conflagration.

Included in the fire-fighting equipment at Wood River are three telescopic type foam towers constructed for fighting fires at the top of tanks. These towers are portable and may be used with both the "wet" and the "dry" foam systems. Foam equipment is also subject to rigid inspection at the refinery.

In an effort to eliminate, as far as possible, the hazard of petroleum fires the staff at Wood River is constantly seeking new means of fire control and extinguishment which might improve existing conventional methods. Rules and regulations are widely publicized and strictly enforced; inspection and maintenance programs are faithfully carried out and employee training is active at all times, with the ultimate result that fire protection has become one of the most important functions in refinery operations.

SHELL MAKES NEWS

Shell Head Views Ruin Wrought By Air Power

Strategic Bombing Aided in Cracking Morale of Germans

H. D. Dale, Refinery Manager of the Shell Oil Company, Wood River, who was a member of the U. S. Strategic Bombing Survey of enemy lands to determine the effects of strategic bombing, said today that the devastation wrought in Germany and Japan was the most important contributing factor in the allied victory.

During the latter part of this year, Dale traveled extensively throughout Japan during which time he viewed both Nagasaki and Hiroshima by air and jeep and saw the desolation caused by the Atom bomb. He refused to comment on the survey's report of the effect of the atomic bomb since the report has still not been released by the War Department.

In speaking of the cities in Germany that had been bombed, Dale said that the devastation was complete. Except for a scattering of houses on the outskirts of the cities, almost all of the buildings were reduced to rubble.

The effect upon German morale was tremendous, the Shell executive declared. Sewer systems, transportation facilities as well as all utilities were disrupted. "In spite of this, disease was kept under control," he added.

Dale, who represented the oil and chemical industries, covered over 6,000 miles of Europe by jeep, and many times that by air. He cites Hamburg as the most devastating single city attack during the war. About one-third of the houses of the city were destroyed and German estimates show 60,000 to 100,000 people were killed.

Dale visited Essen, Hanover, Frankfort and many other of the large cities. He reported that with the exception of the extreme eastern part of the Reich, there was no major city that did not bear the mark of bombing attacks.

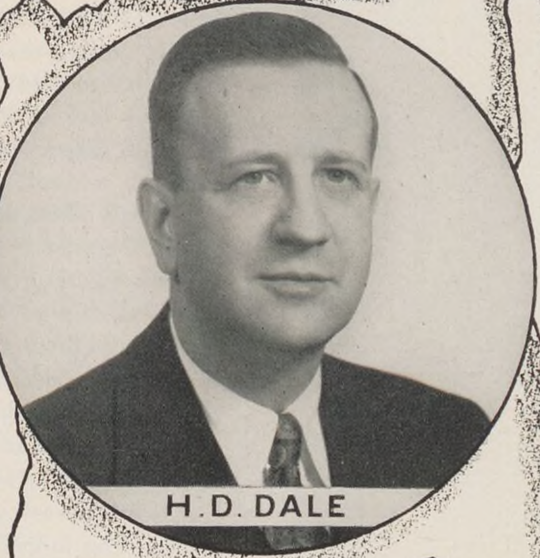
When the German air power had been reduced, Dale said, oil became the priority target for allied bombers. The attacks reduced the production of synthetic plants steadily and by July, 1944, every major plant had been hit. From producing 2,054,000 barrels of aviation gasoline per month, when the attacks began, production fell to 695,500 barrels in June and 110,500 barrels in September.

The output of aviation gasoline from synthetic plants dropped from 1,137,500 barrels in April to 195,000 barrels in July and 32,500 barrels in September. Although production recovered somewhat in November and December, the rest of the war saw but a fraction of pre-attack output.

Dale said the Strategic Bombing Survey was established by Secretary of War Patterson, November 3, 1944, in accordance with a directive from the late President Roosevelt. The chairman of the survey was Franklin D'Olier, president of the Prudential Insurance Company.

Beginning his career with the Shell company 21 years ago, Dale was appointed Refinery Manager of the Wood River plant June 1 upon the retirement of R. C. Roberts. He is married and has one daughter.

The Wood River Journal
Wood River, Ill.



H. D. DALE

"Private Planes Will Total 400,000 by 1955"

New York (AP)—James H. Doolittle, vice-president of Shell Union Oil Corporation, said Tuesday "the conservative estimate" of 400 thousand private airplanes by 1955 was "a goal that will be definitely achieved."

He told the Sales Executive Club and the Advertising Men's Post of the American Legion that of these 280 thousand will be for personal business and recreation. Forty thousand others will be for business activities, he added, and 80 thousand for commercial service.

Omaha (Neb.) Eve. World-Her.

Shell Honors Veteran Employees at Gathering

The annual Shell Oil Company get-together for employees was held on Wednesday and Thursday in the Topaz Room of the Tulsa Hotel. A buffet supper was served. Attendance for the two evenings totaled better than five hundred. Shell "get-togethers" are sponsored by the company for the purpose of honoring employees with long service.

R. B. Roark, vice-president, presented an anniversary emblem to J. E. Simpson for 25 years' service. Also, 20-year emblems were awarded J. W. Cowles and J. O. Lindsey; 15-year pins to J. E. Galley, Helene Hesp, K. L. Houston, C. O. White, F. M. Mesojednik and L. A. Wilmes; 10-year awards were made to J. M. Nash, H. H. Rhoades, D. A. Olds, A. G. Copeland, jr., A. E. Woerheide, jr., Eva Schlender, J. E. Peck and Eulah Foust.

Entertainment consisted of distribution of a booklet entitled "Shell—Soldier and Civilian" telling about the wartime research and development activities of Shell and their application to civilian usage in peacetime. A moving picture produced by the Interstate Oil Compact commission entitled "Oil for Tomorrow" was shown.

Tulsa World

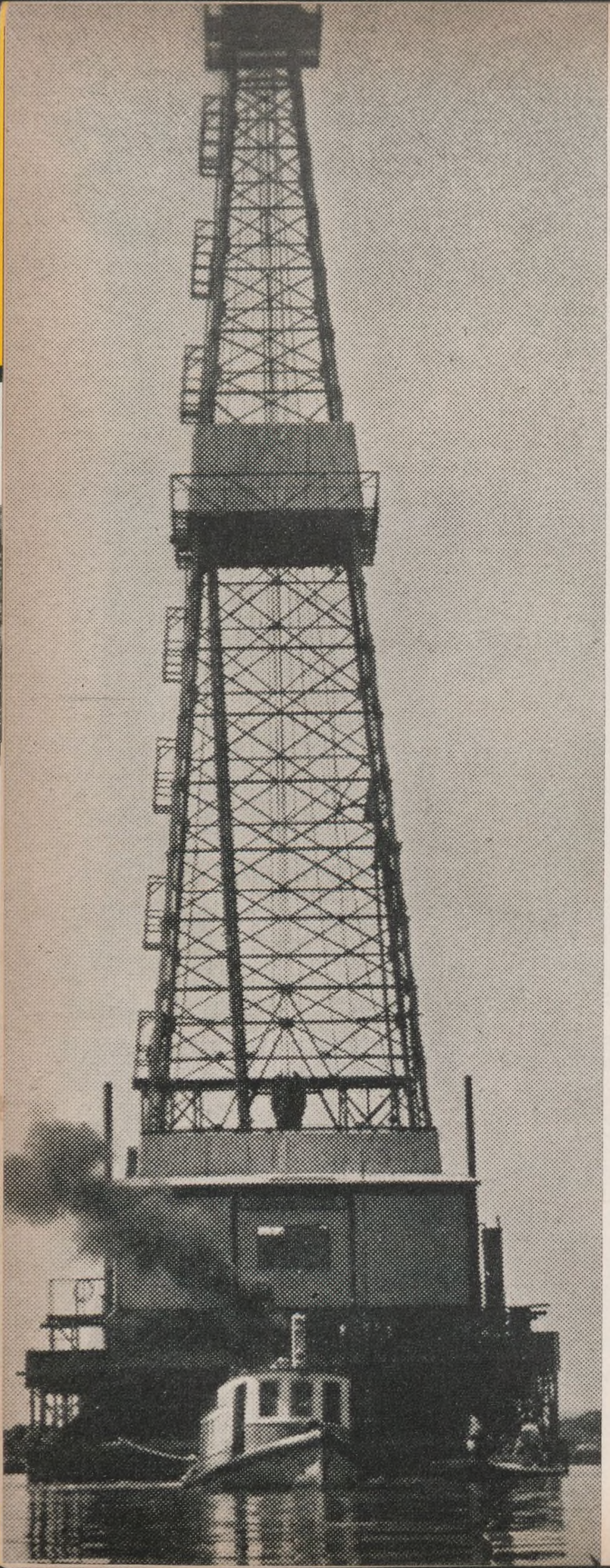
Lathe Design, Operation Subject of New Book

The why and how of lathe design and operation is the subject of a new 160-page illustrated book published by Shell Oil Co., Inc., 50 West 50th Street, New York.

Designed to serve the metal-working industry, book outlines fundamentals of machine tool design and performance, and covers basic characteristics of lathe construction and operation.

Priced at $7.50, book is said to contain over 500 charts, photographs and drawings, many of them in two and three colors. Detailed illustrations show precise functioning of lathe parts.

Steel, Cleveland, Ohio.



Black Bayou

By William M. Cloud and J. W. Watson
Texas-Gulf Exploration and Production Area

FABLED in stories of the old South are the picturesque bayous of Louisiana. The State is sprinkled with these strange waters "lined with hyacinths and camouflaged by overhanging moss-draped oaks." Nowhere is the atmosphere stranger, more exotic, or more picturesque than in the murky, phosphorescent waters known as Black Bayou. And in the small, densely wooded islands dotting the marshlands of Cameron Parish lie Shell's oldest field in Southern Louisiana.

It was back in May, 1929, that the discovery well of the Black Bayou field was drilled and the camp first located on a small knoll. The few houses and several houseboats which made up the early camp scarcely disturbed the island's scenic landscape. But today's thriving community of sixty-four permanent residents and the many others who work there during the week occupies more than a thousand square yards amid the native holly, sweet gum, and cherry trees, the cedar and pine groves and the thick shrubbery that blanket the island.

A thick carpet of San Augustine grass marks the residential section of today's camp and provides a nice contrast for the surrounding trees with their white-washed trunks. The individual dwellings of the permanent residents and the boarding house, the "Hotel" for the non-resident employees, are all freshly painted in uniform colors. Cement sidewalks have been laid to all the buildings, and neatly trimmed hedges guard both sides of the walks. All the modern conveniences from natural gas and electricity to the sewer system and a year round supply of ice are features of this Shell community.

Not far from the residential section, and fronting on the main canal, are the warehouse and offices, the oil house, iceplant, boathouse, electrical plant, and the gas repressuring plant. Just as in any other small town, there is a well-manned volunteer fire department; but as this is a "water" settlement, the equipment for its fire department is on a fire barge.

The only way to reach Black Bayou is to take a boat from Orange, Texas, which lies twelve miles to the northeast, follow the Sabine River to the Intracoastal Canal,

Floating derrick being towed to drilling location

"Shell's most unusual location," say those who live and work there. And when you've finished this article we are quite sure you will agree.

and then follow Shell's own canal through the oilfields to the island. Since water is the only means of transportation, boats and barges are just as vital to the daily life of every resident as they are to the normal field operation. A fleet of six speedboats, six workboats, four barges, two tugs, and two passenger boats, provide the camp with its transportation.

The two passenger boats help out a lot. One, "The Four Brothers," transports the children back and forth into Orange to school. A wartime shortage of teachers made it necessary to close the camp school. The children board the school boat at 6:45 A.M. to make the first class of the day at 8:00 A.M. It is generally mid-afternoon before the children reboard "The Four Brothers" for the return trip.

More familiarly known as the "grocery boat," the "Sally A" makes a regularly scheduled Wednesday, Saturday, and Sunday run into Orange. Of course, it is not like running down to the corner grocery store. Groceries and supplies are purchased only on the Wednesday and Saturday trips; so last minute shopping habits have to give way to thoughtful planning for the semi-weekly order.

The "Sally A" Sunday journey takes those who want to go into Orange to church services, the movies, or the homes of friends. On the Sunday return trip, the various non-resident operating employees who go to their Texas and Louisiana homes for the weekend, return to the "Hotel" for their workweek.

Every part of the Black Bayou fleet has its special job. One of the speedboats makes a trip daily into Orange for the mail. Its return is the high spot in the day, and most of the residents are on hand to greet it and receive their part of the eagerly awaited cargo. Anyone joining the permanent group on the island has a special barge at his disposal to move his personal belongings. The vans are driven right on the flat-topped barge at Orange. Watchers are invariably amused and surprised when they see moving vans actually coming through the bayous. Two houseboats are a permanent part of the Black Bayou fleet although one is kept at Orange where it is used as a terminal depot.

Water-locked as it is, during the hot summer months Black Bayou enjoys the cooling effects of the Gulf breezes

The "grocery boat" landing with the midweek groceries

Lunch time at Black Bayou "hotel"

Children returning from school on school boat, "The Four Brothers"

which do not reach towns north of the swamp country. The breezes over Black Bayou, however, definitely are not an unmixed blessing; since large numbers of deer-flies and mosquitoes drift with them from the swamp area. Luckily, these pests are present only a relatively few days of the year. Other insects do their best to make life miserable for the gardeners; in spite of such difficulties, however, the residents have cultivated many fine gardens in the rich earth of the island.

The marshlands surrounding Black Bayou are ideal for trapping as well as for duck and goose hunting during the winter season. Ducks and geese are common meat on dinner tables for many months in the year. There are deer for those who wish to brave the marshes, and many employees pick up extra money by trapping muskrats, mink, and raccoons. As the weather gets warmer, alligators by the hundreds come out from their winter hibernation. Catching alligators is profitable, since their untreated hides are worth about a dollar per lineal foot. Fishing is excellent here amid the wealth of nearby creeks and canals. Many varieties of fish are caught in quantities, and it is a common sight to see the men come home with great strings of black bass and dozens of perch.

Nature offers a world of sports, of course; but the camp itself affords a surprising number of its own opportunities for amusement. The dining room, a spacious room and one of the coolest spots on the island, is available for dances and parties. Cards of all sorts, bingo and dominos are among the nightly activities. The bridge club meets weekly. Currently under construction is a recreation hall for badminton, volleyball and similar games. The tennis courts have long been completed. The baseball diamond provides the stage for America's number one game.

In the Black Bayou Oil Field, of the 64 wells drilled, 42 have been producers. By the end of last year almost 13 million barrels of oil had been taken from the earth. Three of the wells produced more than a million barrels each by natural flow. They are still flowing strongly.

Today and yesterday make a striking contrast in the Black Bayou country. Shell's first venture into Louisiana's 48,500 square miles in November, 1924, didn't suggest the great producers of the present. The first well, drilled fifteen miles west of Lake Charles, had to be abandoned at the depth of 5,500 feet. It was May, 1929, that Black Bayou first came through with a producer, the Roxana Watkins No. 9, sunk 981 feet down into the wooded, watery swamps.

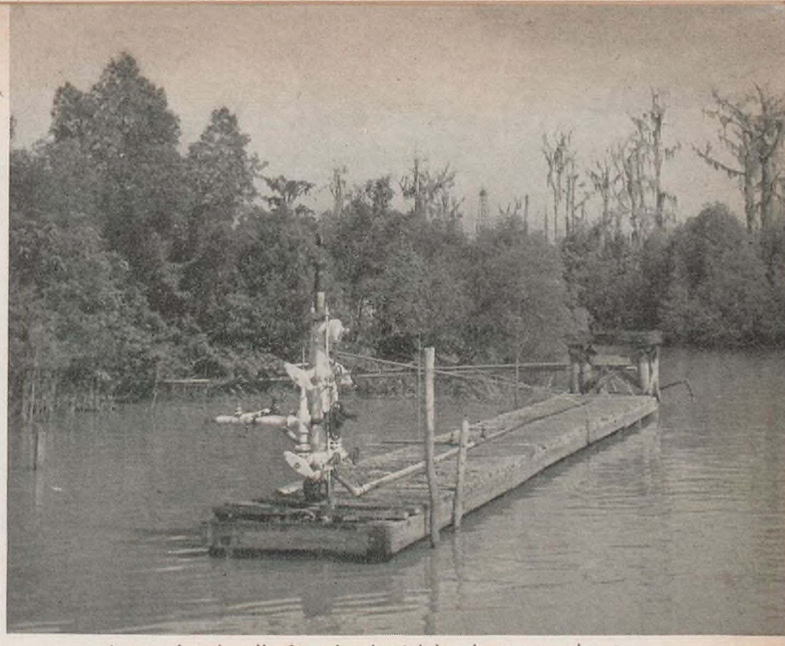
That southwestern part of Louisiana, the Bayou district, makes up a good part of the 16 per cent of the State's area that is generally covered with water. Too much water, in fact, was the problem that faced Shell men in the Bayou regions. It was a problem that antiquated the existing swamp drilling methods and led to Shell's first marine drilling operations. The previous process of constructing heavy board roads through the swamps, of transporting tons and tons of heavy drilling equipment over these roads to the wells became increasingly costly in both time and money. To the tedious trucking of the heavy machinery and piping over unstable terrain were added the slow but necessary labors

Ovie Michell uses a winch to lift one of the huge ice containers; 2,400 pounds of ice daily are furnished Black Bayou residents.

of loading and unloading. Preparation of the well locations and the drilling unit foundations further complicated the engineering problems. The only means for supporting the equipment then devised was to drive several hundred wooden piles into the marsh. That meant that for every new well there were the same huge difficulties of road building, trucking, pile driving, and construction, to be overcome.

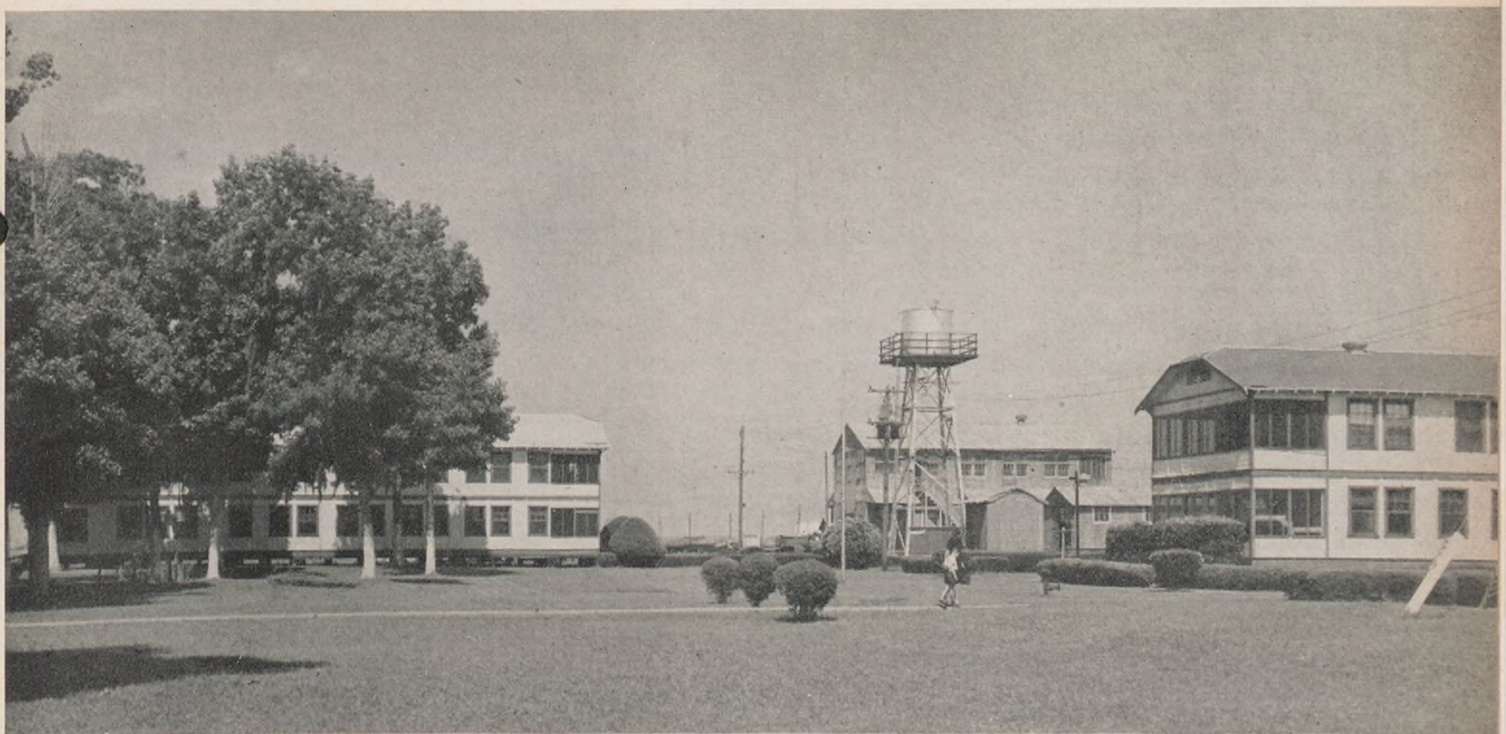
The development of submersible drilling barges, regular floating derricks, changed things. Entire drilling and power plants could be erected on them. A Shell drilling barge, for example, is a U-shaped affair that supports a 136-foot derrick along with mud tanks, engine room, circulating pump, and other necessary machinery. The "power" barge makes up the other main section of the drilling outfit. It holds four 125 horsepower steam boilers as well as an electric generator.

Needing only from six to eight feet of water, the barges can be moved through the connecting canals and bayous in a matter of hours rather than weeks. Everything involved in the whole operation—all the supplies, the operating crews, the equipment, and even most of the communications equipment—is water-borne. Houseboats serve as an "on-job" home for the workers. Tugboats and motor boats have replaced trucks and automobiles, and the roads are the century old bayous. The dredging and swamp clearing that is necessary is a small matter compared to the enormous effort required for constructing the old style board roads.



A completed well after the derrick has been moved out

Particularly in these fields of coastal Louisiana have the newer methods of swampland drilling been both vital and successful. And paralleling Shell's success in solving the water problem has been the growth and success of the Black Bayou camp. Its residents are justly proud of their community—its school boat, the grocery boat, the "Hotel," and their homes. They are proud, too, of the beauty of the surroundings, a beauty of which their community is a part. Few readers will dispute the claim that this community is ". . . the most unusual of Shell locations. . . ."



The bunkhouse, office building, and boarding house at Black Bayou

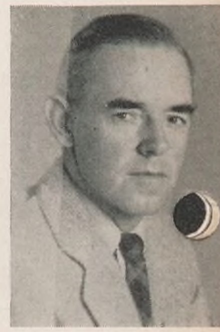
SHELL IN THE

DR. M. E. SPAGHT

C. W. HUMPHREYS

M. R. SPRINKLE

E. S. ROBB



R. HALDANE

DR. M. E. SPAGHT has been appointed Vice President of the Shell Development Company. In this position in New York, he will maintain close touch on technical developments with Government agencies, the Army and Navy, and scientific institutions East of the Rockies. Dr. Spaght, who received his A. B., A.M., and Ph.D. in Chemistry from Stanford University and studied at the University of Leipzig, came directly to Shell upon completion of his studies in 1933. He started as a Research Chemist at the Martinez Refinery and went to the Wilmington Refinery in 1935 as a Technical Assistant. As Manager of Research and Development at the San Francisco Manufacturing Department Office from 1940 to 1945 he supervised the planning and processing of the Pacific Coast refining expansion for wartime production. Early in 1945 he went to Europe as a member of the U. S. Naval Technical Mission. Later that year, he went to Japan as a director of the U. S. Strategic Bombing Survey. Upon his return in December 1945, he became Manager of Manufacturing, West of Rockies, the position he held at the time of his appointment as Vice President of Shell Development.

CECIL W. HUMPHREYS has been named Manager of Operations at the San Francisco Office of the Shell Chemical Corporation. With an A.B. degree from the College of the Pacific and a Ph.D. degree from Stanford, Humphreys began work as a Laboratory Assistant at the Shell Point Plant in 1931. He became a Chemist and transferred in that capacity to the Martinez Refinery before becoming Chief Chemist at the Dominguez Refinery in 1935. Made Assistant Superintendent in 1938 and Superintendent three years later at Dominguez, he moved to Houston in 1941 as Assistant Superintendent of the Shell Chemical plant there. From 1945 until his latest appointment, he was Superintendent at the Houston Plant.

MARSHALL R. SPRINKLE has been named Assistant Manager of the Development Department at the San Francisco Office of Shell Chemical Corporation. Before coming to Shell in 1933, he obtained an A.M. degree from Wake Forest College, N. C., and a Ph.D. from the University of Wisconsin. After early positions as a gauger and a Junior Experimental Chemist at Wood River, Sprinkle was appointed Junior and then Senior Technologist. In 1941 he became Manager of the Light Oil Treating Department. Transferring to the Gas Department as Assistant Manager in 1942, be became Manager of that Department in September, 1943.

E. S. ROBB has been named Assistant Manager of the Engineering Department of Shell Chemical Company in San Francisco. A graduate of Rice Institute, B.S. in Mechanical Engineering, he came to Shell in 1926 as a surveyor for the Exploration Department at Houston. Robb was transferred to the old East Chicago Refinery in 1930 and after 8½ years in various positions there he moved to Wood River Refinery to become Master Mechanic in the Engineering Department. That was in 1939. The following year he was transferred to a similar position at the Houston Refinery where he later became Assistant Chief Engineer and in 1943, Chief Engineer.

PEOPLE NEWS

H. LeBOURVEAU

HARRY LEBOURVEAU, Manager of the Sewaren Terminal in New Jersey, died on Monday evening, July 8. He was 52 years of age when he succumbed after a three months' illness.

Trained in engineering at St. Laurant College in Montreal, LeBourveau started to work for Shell as an estimator in 1930. A forthright personality and managerial resourcefulness characterized his Shell career and led to his appointment in February, 1943, to the heavy wartime responsibilities of running Sewaren, where his record has been one of unsurpassed excellence. The Woodbridge (N. J.) Independent-Leader paid high editorial tribute to his record and his character, a sign of respect and admiration that all Shell men share. Our sympathy goes out to his wife and his daughter.

G. A. LORENZ

W. B. CASE

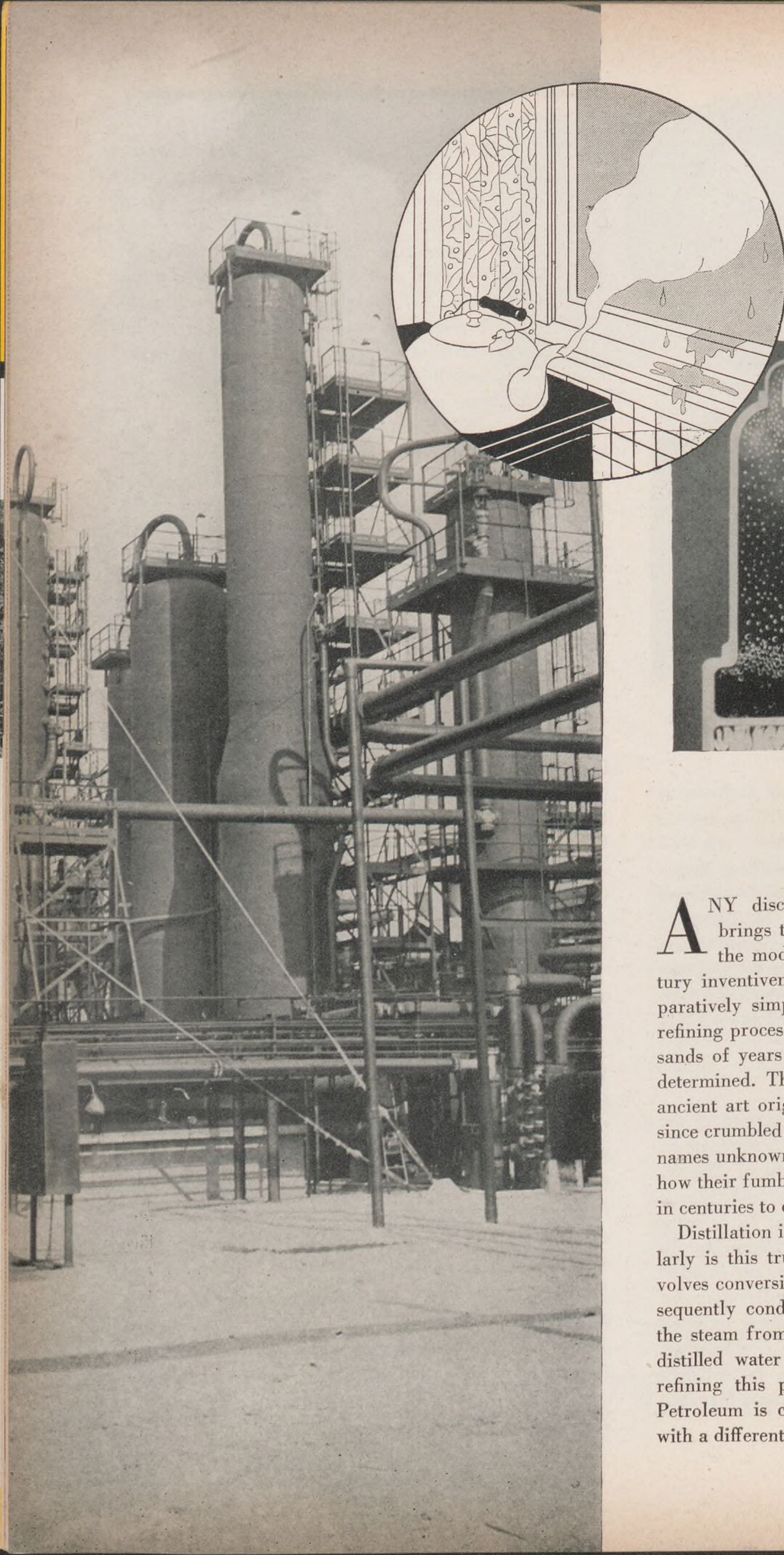
J. G. CAMPBELL

ROBERT HALDANE has been named Chief Engineer at Houston Refinery. Haldane came to the Company in 1930, a year after his graduation from New York University with a degree in Mechanical Engineering. Beginning as a Gauger at Houston in the Cracking Department he was soon promoted to the position of Technical Assistant. Haldane became Office Engineer in 1934 and Utility Engineer in 1937. He left Houston for military service in August, 1942, returning in 1945 with the rank of major, to become Engineer, and then Assistant Chief Engineer.

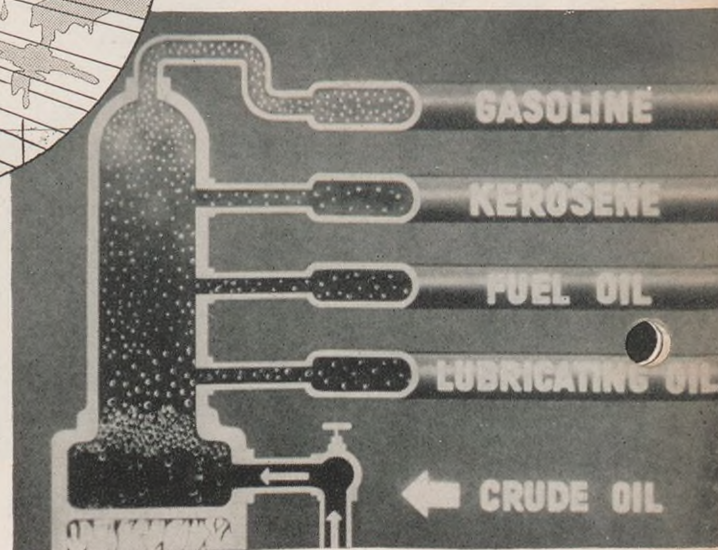
GEORGE A. LORENZ has been named Manager of the Gas Department at Wood River Refinery. A graduate in Chemical Engineering from the University of Illinois, Lorenz came to the Company in November, 1935, as a Junior Special Research Chemist at Wood River after earning his Ph. D. at the University of Minnesota. In 1939 he became a Senior Research Chemist, and in 1940 Senior Technologist in the Manufacturing-Development Department in New York. During 1941, Lorenz returned in that capacity to Wood River and later became Assistant Head of the Alkylation Department there. Immediately prior to his latest appointment, he was Assistant Manager of the Cracking Department.

WILLIAM B. CASE has been named Assistant to the General Manager of Transportation and Supplies in New York. A native of Denver, Colorado, and a graduate in Petroleum Engineering from Colorado School of Mines, Case joined the Company as Valuation Engineer in the Production Department in Tulsa in June 1923. In 1928 he went to St. Louis and in 1934 was transferred to Shell Union-New York in a liaison capacity between Shell Union and Shell Oil Exploration and Production Departments. In 1940 he became an assistant in the President's Office of Shell Oil and, following an assignment as Assistant Manager of H. O. Crude Oil Department he was appointed Acting Manager of the Crude Oil Department —Tulsa in April 1942 where he served until his present assignment.

J. G. CAMPBELL, JR., has been appointed Manager of the newly created Economics and Statistics Department in New York which will keep Shell advised on economic factors, reports, and trends. A graduate of Amherst College. A.B., 1930, Campbell came to Shell in 1941 from a prominent investment firm where he was Manager of the Statistical Department. In 1942, he became office assistant to the Manager, Crude Oil Department and Secretary of the Crude Supply Committee. From 1943 until his recent appointment, Mr. Campbell was Employment Representative in the Personnel Department, except for 18 months on active naval duty during which he became a lieutenant and sailed on a transport to the far reaches of the Pacific.



In the great towers of modern refineries (far left) one sees the fruition of the distiller's art. Distillation is most clearly illustrated, however, by the steam from a boiling kettle (left) which condenses against cool surfaces as distilled water. Below, the graph shows the effect of distillation on crude oil.



Distillation

ANY discussion of petroleum refining inevitably brings to mind the huge, complex mechanisms of the modern refinery, each a product of 20th century inventiveness. Yet few of us realize that one comparatively simple operation is the pivotal point for all refining processes. And it is not new; it was known thousands of years ago—just how far back no one has ever determined. That first, fundamental step is distillation, an ancient art originally studied in laboratories which have since crumbled into dust. Scientists, long dead, their very names unknown or forgotten, scarcely could have guessed how their fumbling efforts would affect the lives of people in centuries to come.

Distillation is widely used in modern industry; particularly is this true in petroleum refining. Basically it involves conversion of a substance into vapor which is subsequently condensed into liquid. A graphic example is the steam from a kettle spout condensing as droplets of distilled water on nearby cold surfaces. In petroleum refining this process is, of course, more complicated. Petroleum is composed of a number of products, each with a different boiling point. Separation and segregation of these products is accomplished by distillation. The products to be separated are heated by passage through pipe coils suspended in fired furnaces. Heated oil then flows to great fractionating (distilling) towers where liquid and vapor components are separated by means of specially constructed trays or bafflles. After leaving the tower, the vapors contact small tubes filled with cold water and condense as liquid products which are removed for further treatment.

THE ANCIENTS PRACTICED DISTILLATION

The scientific premise on which these operations are based is the very same as that which motivated the ancient alchemists' experiments. Actually, the separation of liquids by boiling them and condensing their vapors dates back hundreds of years before Christ. Some dispute exists among historians as to whether the Chinese or Egyptians were the world's first distillers; both are known to have practiced the art long before the 1st century A.D. The fact remains that centuries later, the Alexandrians, city-dwelling descendants of the Egyptians, seemingly profited by an earlier heritage and became expert in making stills. They also discovered that certain oils suffer marked decomposition upon direct heating and conducted distilling operations in the presence of water. That probably was the first attempt at steam distillation.

A number of other ancient peoples, among them the Celts, Greeks and Romans also engaged in distilling, yet they were unable to make scientific application of their knowledge in laboratory experiments. That all-important step was taken in the 1st century A.D. by the Copts of Alexandria, who apparently were the earliest chemists. They and their Syrian disciples designed distillation apparatus in which they attempted to separate the "spirits" from the "bodies" and to condense these spirits into so-called "heavenly bodies." Sulphur, arsenic and mercury and their compounds were obtained in this fashion.

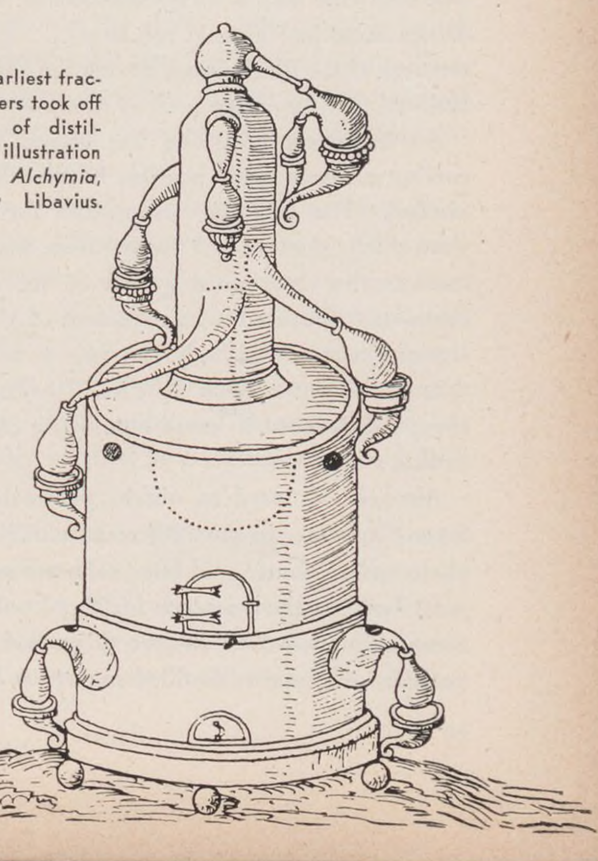
The chemist of that day was faced with a multitude of problems, for the infant profession had no legacy of past research. Even his apparatus was adapted for the most part from models used by cooks and doctors. It consisted of a still or large vat, and capital, a small attached chamber in which vapors were condensed. A spout led to the receiver. The distillate was run off through the spout to the receiver which was cooled by wet rags. Aside from the crudeness of these instruments the chemist had no way of measuring temperature; consequently his operations were limited.

During the period between the 8th and 15th centuries the Copts' work was carried on by the Arabs. They improved the cooling apparatus by running cold water around the pipe leading from the still head. The distillation of alcohol from wine, and oils from plants is credited to them as well. Their work enabled scientists who followed to study hydrochloric, nitric, and sulphuric acids in a relatively pure state.

England obtained her first authenticated knowledge of distilling after the invasion of Ireland in 1170. The invaders found the Irish manufacturing spirit from grain, a liquor they called usquebaugh. This was a later version of the ancient Celtic "uisge beatha" or barley brew, original ancestor of our whiskey. Abbreviated to "uisge" the Gaelic phrase automatically becomes "whiskey." Shortly afterward, distillation appeared on the continent of Europe.

A number of problems which had retarded the distiller's progress were solved when experiments with products of hitherto unknown reactions made possible further changes in distilling apparatus. Older mechanisms were in general use until around 1250 when a single apparatus

through the Ages . . . by Claire Lewis



One of the earliest fractionating towers took off five streams of distillate. This illustration appears in *Alchymia*, authored by Libavius.

was first developed to combine both the still and the capital . . . the retort. It permitted the manufacture of acids and other corroding substances which previously had caused much trouble.

Cooling techniques, another stumbling block for the alchemists of the period, were employed with several variations. The first, and simplest, involved cooling the spout of the capital. Another was that of a Florentine chemist of the 13th century who used a snake-like coil in a water-filled trough, ancestor of the modern coil condenser. Cooling was also achieved by enlarging the surface of the capital. An example is the conical form of capital, known as the rosenhut, which enjoyed only a brief vogue but was the forerunner of the modern vertical bulb condenser. Another consisted of a capital enclosed in a water-filled bladder. This came to be known as the "Moor's head," and led, eventually, to the introduction of continuous cooling methods.

DEVELOPMENT OF WINES AND LIQUORS

The evolution of distillation processes in this period is closely associated with the development and manufacture of fermented wines and liquors. A 13th century chemist and philosopher, Raymond Tully, of Majorca, handed down an unusual recipe for the distillation of wine. It was "to be digested during 20 days in a close vessel by the heat of fermenting horse dung," he wrote, "and then distilled in a sand bath with a very gentle fire. The true water of life will come over in precious drops, which, being rectified by three or four successive distillations, will afford the wonderful quintessence of wine." Alcoholic drinks came into general use later . . . approximately at the time of the Black Death during the 14th century. It is believed that they were used as tonics and stimulants.

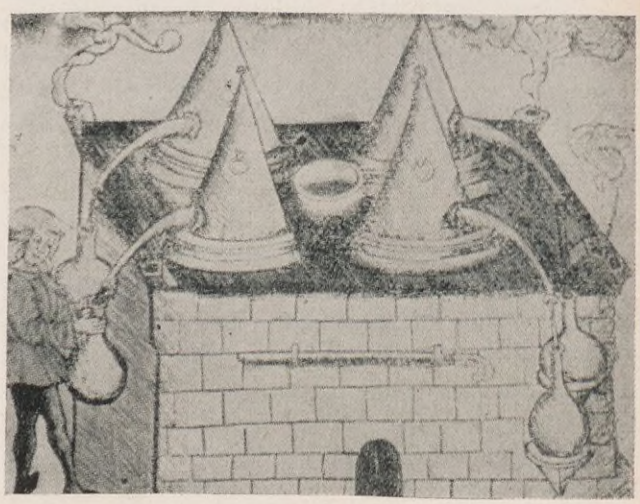
An important milestone was passed when improved cooling methods made possible large-scale distillation of alcohol. The chemists responsible for this discovery were chiefly doctors and apothecaries, many of the latter monks, who contributed greatly to the development of chemical tools. As the manufacture of gin, aquavit, and liqueurs spread through Europe, a new craft arose, that of the professional distiller. Growing demands for chemicals resulted in more men being especially trained in that work.

Alcohol was used to obtain pharmaceutical extracts from plants late in the 12th century. The production of nitric and sulphuric acid from saltpetre and vitriol was a great boon to the scientists for they could now dissolve many substances and subject them to further chemical analysis. Alchemists distilled numerous liquids of varying origin which they referred to as "waters." Concepts of words such as "gas" and "spirit" changed and broadened. The terms "still" and "distill" were first heard in the 16th century, and "distillation" then came to mean a process of combined evaporation and condensation. Distillers did not completely understand cracking and melting operations but recognized them as forms of distillation.

A 16th century writer, Porta, was much impressed with the potentialities of distillation judging from this comment: "This admirable art teacheth how to make spirits and sublime gross bodies. . . . We can by chymical instruments search out the vertues of plants and better than the ancients could do, by testing them . . . a dull fellow will never attain to the art of distilling." Porta also dispensed practical advice: "If you distill common oyl, it will hardly run. You must be very careful that the ashes and pot do not wax too hot, for if the oyl within takes fire it will break the vessels and flie up, that it can hardly be quenched, and reach the very ceiling; so that it is best to operate upon oyls in arched rooms."

RENAISSANCE AND REFORMATION

With the coming of the Renaissance and Reformation periods France, England, and the Low Countries became leaders in science, industry and trade. Spectacular advances were made in the fields of mathematics, physics, astronomy and mechanics but similar progress in chemistry was much slower. This may have been because chemists continued to depend on scientific recipes until 1750, rather than exact measurement and experiment. Thermometers and other implements were known in many fields, but had not yet been adapted for the chemical laboratory. However, a significant development was found in



A 16th century distillation furnace with four stills. Each has a conical capital or "rosenhut", ancestor of the vertical bulb condenser.

Around 1550 sulphur was refined by distillation. This picture appears in the work of Agricola, which was published early in the century.

the teachings of the Swiss pharmacist, Paracelsus, which emphasized the importance of chemistry to medicine and elevated the apothecary to a prominent place in the scientific scheme. Early in the 16th century papers written by practical men such as Biringuccio and Agricola, tell of the application of distillation processes to the manufacture of mercury, sulphur, and acids. Herbals and "Distillation Books" were written by a number of physicians, apothecaries and botanists.

Production of mineral and vegetable oils in the Low Countries, particularly, increased to keep pace with the active trade between those countries and the East and West Indies. The general consumption of distilled liquors spread throughout Europe. Monasteries in France and Germany "burnt" their own waters. New distilling centers sprang up in many towns and there was fierce controversy between them about the merits of their respective products. But the infant distilling industry remained conservative in temper, using only old forms of apparatus which had been tried and proven. Up to the middle of the 17th century there were few new instruments introduced, but the quality of the old was substantially improved by advances in the manufacture of glass and earthenware.

Certain wasteful methods of redistilling were still employed. Gases, finally, were acknowledged as substances even more subtle than spirits. Attempts were made at steam distillation, but cooling methods changed slowly. The outstanding practical achievements of the period appeared in the design of various types of chemical and distillation furnaces. One of these possessed a filling funnel for fuel and could burn evenly over a long period.

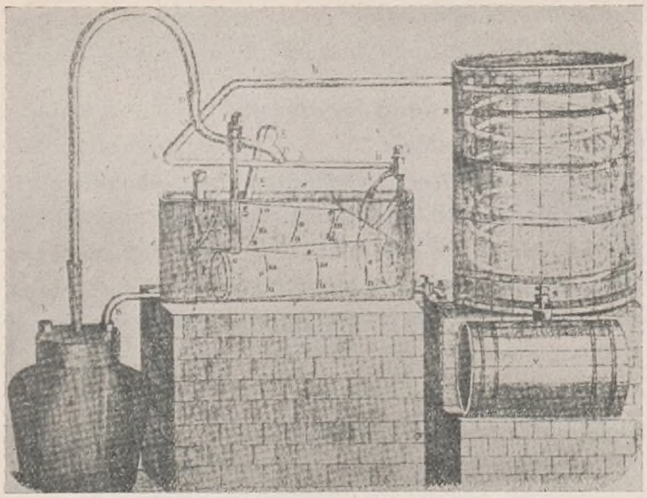
NEW CONCEPTS

Scientists were more interested in theory than in practical technology and their theories found expression in the rise of technical and scientific education at the turn of the 18th century. The movement gained momentum; after 1750 a steady stream of technological literature flowed from scientific pens. But distillers were still slow to embrace new methods. They were only as good as their equipment which, in turn, was crude because of their limited understanding of certain essential elements such as heat and gas. The picture lightened somewhat at the close of the century. Then apparatus for vacuum distillation came into use in the manufacture of alcohol. New concepts of gases and the introduction of quantitive chemistry gave a fresh impetus to the development of chemical apparatus. Methods of continuous cooling had long stumped the technologists, but improved equipment led to general application of continuous cooling and new types of condensers. Salient factors in the new trend were the appearance of the kerosene burner and the derivation of light gas from coal. Another practical achievement of the period was the production of potable water from sea water.

The growing alcohol industry was chiefly responsible for the rapid developments in industrial distillation during the early 19th century. For years manufacturers of alcohol had been searching for a cheap substitute for corn; they found it in the potato. Other substitutes followed in the guise of sugar beet pulp and molasses. These new base substances provided thicker mashes and required special distilling equipment of greater capacity, operating continuously.

New scientific theories of heat began to take shape. Prior to this time chemists were unable to adequately control or measure heat. With the appearance of standard thermometers, however, they could gauge temperatures and determine the boiling points of substances, so important in distillation. Heat theories evolved rapidly through the collaboration of engineers and theorists; their conclusions eventually resulted in a mathematical approach to distillation.

In 1826 it was found that oil was lighter in color, better-smelling, and suffered less decomposition when steam was injected into the still. Later, superheated dry steam was applied to reduced pressure distillation. Oils could then be distilled at low pressure without the introduction



This mechanism came into use early in the 18th century. It was known as the Berard still and employed a horizontal fractionating column.

of an excessive amount of water. This made a tremendous improvement in the quality of distilled materials. Further development of evaporation techniques was to exert a strong influence on the design of stills and columns. The gap which had previously existed between scientific theory and practice gave way to a close and productive contact.

ANOTHER COMMERCIAL GIANT

In the latter half of the 19th century new industries were emerging upon the international scene with the practical harnessing of electricity. The tar industry went through a spectacular period in the production of new dyes, solvents and other chemicals and soon adapted old forms of alcohol distilling apparatus to new uses. But another commercial giant was soon to dwarf this industry. As early as 1840 chemists in many countries began to manufacture mineral oils closely allied to petroleum. Scotsman James Young experimented with the distillation of petroleum in 1847 and secured both illuminating and lubricating oils. But he could not obtain petroleum in quantity and turned to coal. Young's success with the distillation of coal shale marked the beginning of that industry in Scotland, and the prominence of oil as an illuminant.

In America similar developments were taking place. The first successful attempts to distill illuminating oil from coal in the United States were made by Dr. Abraham Gessner in 1846. Gessner gave the name "kerosene" to oil he obtained from coal. By the time of the discovery of the Drake well there were approximately forty coal oil or kerosene plants in operation. This meant that the refining of oil could be conducted almost immediately on a commercial basis. Many refineries of coal oil adapted their plants to distill the new raw material. Others set up stills near new wells to make profitable use of the oil as soon as it emerged from the ground. These stills were cylindrical in shape with capacities of one to five barrels a day. In 1860 the first petroleum refinery was constructed, others came soon after: their production was from one to a hundred barrels a day. In a memoir written by the Massachusetts state assayer and chemist in 1872 he reported that nine commercial products were then being distilled from petroleum.

Continuous distillation processes for petroleum refining came into use around 1885. Stills were placed step-wise in batteries, and accommodated 5000 barrels a day. Crude was pumped into the highest still and the vapor from it was condensed into light gasoline. Then the residue would overflow into the second still and so on down the line. Various "cuts" or products were taken from each still, then redistilled to meet marketing standards. Redistilling operations were conducted in the presence of steam to lower the boiling point of the material.

Later, fractionating towers were mounted over steam stills and reduced the expense of the redistillation process. Two other significant technological advancements were the pipe still and the bubble tower. The former improved heat transfer and allowed a tremendous increase in unit capacity. The bubble tower aided in fractionation.

In Europe during the past sixty years the story was much the same. Russia developed her own oil industry and took the lead on the continent by adapting tar stills and columns to the requirements of petroleum refining. Calculations for still and column design were put on a more scientific basis and gradually, step by step, the way was prepared for the great cracking plants of the twentieth century. Petroleum refining has reached such a high stage of development, however, that distillation is no longer an end in itself but serves as the starting point for a number of other involved processes. And from these operations—topping, cracking, isomerization, polymerization, hydrogenation—originate the thousands of petroleum-derived products so indispensable to our everyday lives.

Petroleum engineers in the United States have done an outstanding job in advancing distillation processes. Technicians in research laboratories, working on problems remote from distillation, have discovered new solutions to old problems in unlikely places. The twentieth century theorist is working hand in hand with the engineers to advance distilling methods.

But refining processes the world over still bear the indelible stamp of the ancient alchemist . . . each new plant combines the basic principles he first used, principles evolved slowly and laboriously through the years. In the giant distillation mechanisms of modern industry, in the scientifically calculated heating and condensing units, in the experimental laboratory, can be seen the culmination of an ancient art, which, after centuries of groping infancy has reached a powerful maturity.

'ROUND THE REFINERIES, AREAS, AND DIVISIONS

The Speedway Race Track at Indianapolis, Indiana, was the scene of an exciting 500-mile race recently. Here we see National Champion Rex Mays seated in his Shell-fueled racing car while standing behind him are l. to r. E. H. Cain, Sales Manager of the Indianapolis Marketing Division, Mr. Bowes, President of Bowes Seal Fast Corp., Shell Dealer Wintergust, Frank Sipe of the Division Aviation Dept., and Bert Gwynn, District Manager.

Scenes from the Baltimore Division's annual outing, held late in June at Kurtz's Beach near Baltimore.

Members of the St. Louis Marketing Division at a gathering early in July.

They Map The Way

ON almost any day of the year a Texas-Gulf Area man, carrying survey equipment, pushes his way through the woods and heavy undergrowth of East Texas, over the plains of West Texas, or through the swamplands of Louisiana. He stops occasionally to examine a tree marked with crosses, a rock, or even a pile of buffalo bones that may be a boundary sign for his survey. On this same day, in a well-lighted room on one of the top floors of the Shell Building in Houston, Texas, another man sits before a desk painstakingly constructing a map. In setting, the two jobs may seem unrelated, actually both are important steps in the Land Department's function of preparing a block of leases to be explored for oil and gas.

Both jobs come under the supervision of the Land Department's Drafting-Survey Division, headed by G. W. (Buck) Herzog, with H. S. Bragg as his assistant. Composing the Division are the Survey and Engineering Section under the supervision of S. P. Chapman; the Map Construction Section under the direction of R. T. Wilson in the absence of George Warren who is on military leave; the Land Drafting Section headed by J. E. Darby; the Reproduction Section under F. A. Duval; and the Map File and Reference Library supervised by Elizabeth Carter.

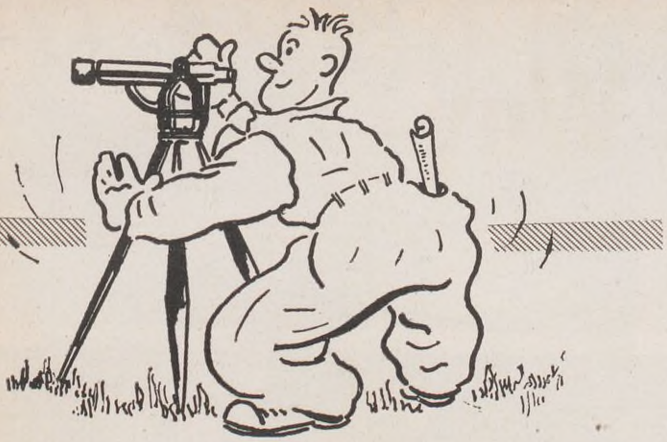
Under the direction of Chief Surveyor Chapman are two office engineers and a clerk, who work in the Houston office, and five field survey parties operating in the Texas-Gulf Exploration and Production Area. The office force coordinates work of the field parties and correlates the data to be used in survey work.

Surveying in swamplands of Louisiana.

Digging for old, buried property corner at road intersection.

It is also a liaison group, linking the operations of the survey parties with related work in other departments. Survey parties uncover the facts as they actually exist on the ground. Before the Land and Legal Departments can insure a clear title to the tracts under lease, a field engineer must complete his assignment and submit his report. To get some idea of this work, let's follow a survey and engineering assignment.

A request is received for the survey of our leases in a new area. First the chief surveyor must procure all paper data relating to the job. For example, if the area to be surveyed lies in Texas, he must make a trip to the General Land Office in Austin, the state capital, and search its files for old survey information that still plays an important part in a current survey. Frequently the files contain material recorded over a hundred years ago, and, as a result of Texas once having been a part of Mexico, many of these records are written in Spanish. While this material is being collected, office engineers assemble an outline of the area to be surveyed, abstracts, descriptions of Shell leases, attorneys' opinions, and other information of value. All of this is then turned over to the field engineer who prepares two maps: one is called a "*patent note drawing*" from field notes of the surveyor who laid out the land when the State divested itself of title, and the other "deed note drawing" which shows all subsequent partitions of the original land grants. These maps will be the field engineer's guide, the nucleus around which he builds the survey, and with their completion he is ready to begin his field work.



His first step is to make a celestial observation so that he can orient the work to true north-south and east-west directions. Then he starts an involved retracement survey to locate the original boundaries. When this retracement survey is completed, the engineer has the base on which to build additional survey work made necessary by the fact that portions of the original tracts have been deeded to additional owners. He turns to the "deed note drawing" that was prepared from the abstracts and county records. Any part of this work that influences the boundaries must be retraced and correlated with the original survey. This done, the engineer reduces the over-all picture to one set of correct boundaries as they are reflected by today's land ownerships. In addition, he notes all evidence of occupation of the land: the location of fences and barns, and the presence of trappers and squatters.

A detailed survey map and written engineer's report are compiled in the field office. When completed, the map shows the size, shape, and area of our lessor's property, the location of his fences and improvements, and signs of encroachment by adjacent property owners. The typewritten report supplements the map with supporting data.

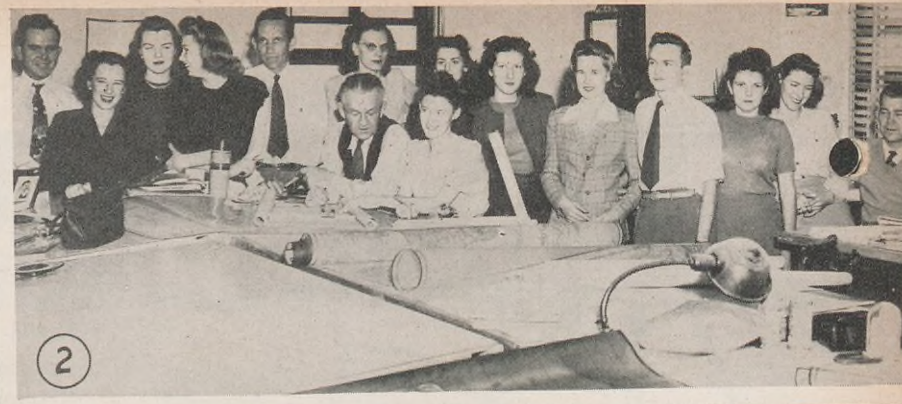
After field work is finished, the engineers bring the data to the Houston office, where a discussion is held to give all interested departments the highlights of the survey. A complete copy of the report is then furnished the Title & Rental Division and any questions pertaining to the survey job are now directed to the office engineers for solution.

However, a survey assignment is not nearly so routine and simple as this brief outline might indicate. The field engineer must have a wealth of knowledge and experience in surveying techniques coupled with a thorough understanding of local historical surveys. His job is one of research that may take him from the Archives of the General Land Office to the county courthouse, to the personal records of individuals, and through the fields and forests of the area to be surveyed. He must be a student of history, several branches of science, and law as it is applicable to the proper placement of land boundaries. The influence of Spanish, French, and English land laws upon the American colonists is still reflected in today's laws. These influences vary with the localities, and each must be recognized and considered.

Retracing the original survey is a sort of treasure hunt in which nature may have obscured the clues. Because erosion and accretion cause the channels of streams to change, river beds may be as much as three-quarters of a mile from the location recorded by surveyors a hundred or more years ago.

Trees are often marked to establish a property corner during the original survey. In a retracement survey the engineer must have sufficient knowledge of botany and plant anatomy to locate and identify these witness trees, if they are still standing. He must be able to distinguish a pin oak tree from a scrub oak; a walnut tree from a pecan. Because a tree's inner wood does not change with growth, any mark on it remains until the tree is cut down or destroyed. However, the type of mark or its age cannot always be determined from an examination of the exterior bark. In this event the wood must be cut away and the number of growth rings counted back to the layer on which the mark was made. Success of a properly constructed retracement survey depends upon the ability of a well-trained, experienced surveyor to find and fathom these small but valuable clues.

Surveyor sets up transit over a property corner.



LAND DEPARTMENT'S DRAFTING-SURVEYING DIVISION

(No. 1): Members of the survey section. Upper row, Forrest Adrian and L. P. Carr. Lower row, S. P. Chapman and Rosemary Scott.

(No. 2): Land-Drafting Section Members.

(No. 3): Members of the Reproduction Section.

(No. 4): The survey party chiefs. Upper row, left to right: H. L. Ohlinger of Party No. 2; J. C. Schwartz of Party No. 5; and L. H. Moncrief of Party No. 3. Lower row: E. Burnett of Party No. 6 and W. G. Mutersbaugh of Party No. 4.

(No. 5): The Map File and Reference Library and its staff.

(No. 6): Map Construction Section of the Land Drafting-Surveying Division.

Surveyors making a solar observation to determine directions.

Surveying work has its full share of thrills and oddities. For instance, almost all of the retracement work in one of the coastal Louisiana areas was done from pirogues. Each man had his own small boat and carried, in addition to his cutting tools or chaining equipment, a small paddle or oar. The instrument man had a "chauffeur", but everyone else furnished his own power. Water in this area was around two feet deep, cut up with hundreds of deep sloughs and bayous. Naturally spills were frequent among those unaccustomed to handling the pirogues.

On another occasion all of the field work in a particular West Texas area was done at night. For some six weeks the work was carried on by means of lights by which a series of angles were read. This method of operation had to be adopted because great accuracy was required over long distances. A light at night can be sighted much farther than an object in the daylight, and the surveyor's vision is not distorted by the influence of heat waves.

Information collected by the surveyors, plus additional types of engineering, geological, and recorded data are graphically presented for study and use by the draftsmen in the Map Construction Section. The work of this section is map-making, the art that projects portions of the earth's surface upon a flat surface so that an area covering thousands of square miles can be studied from a sheet several feet square.

Regional base maps constructed for the geological section of the Exploration Department cover an area as large as sixty miles east and west, and 200 miles north and south. The information on the maps is limited to lines of the original survey plus the major streams and highways. The maps are used by the geologists for studying both surface and subsurface geology. Other base maps, made for the Geophysical Section, are essentially this same type but cover a smaller area. These maps are constructed from aerial photographs, government survey data, railroad alignment sheets, and other reliable information.

Ownership maps are those that show, in addition to the lines of the original survey and sections, the individual tracts, together with the names of the landowners and the owners of oil and gas leases. This type of map is made for the Land, Production, and Exploration Departments and is made by counties or parishes. "Unit" maps are those on which the land has been laid out in townships and groups of townships. Still another type of map constructed by this section is the area map, a large-scale map of active or producing areas which is usually made from data collected by the field survey parties. In addition to constructing maps, this section also prepares organization and statistical charts for other departments.

Working in the same big drafting room with the Map Constructing Section are the members of the Land-Drafting Section, whose responsibility is to post all Shell leases, well locations, scout information, and competitors' leases, and to correct names of lease and fee owners. Some 400 maps already on file must constantly be revised. When it is considered that well-posting alone involves some 7,500 well locations, 1,000 corrected locations, and 6.500 completed wells annually, the enormity of this job is evident.

Prints of these maps are made by the Reproduction Section. Average monthly production by this section last year was 4,346 eighteen by twenty-four-inch photo copies and 32,133 square feet of print work. In the Map File and Reference Library five people keep track of some 4,000 tracings, negatives, and prints of ownership maps for the Area. They also have the responsibility of recording, issuing, and filing approximately 20,000 government-published maps and aerial pictures. The most interesting documents in the map room are the aerial photographs. Covering a Gulf Coast area of 1,425 miles in an east-west direction and 550 miles north-south, these aerials, if placed side by side, would show the plains and hills of the Southwest, the bayous and swamps of Louisiana, the pine woods of Mississippi, and the Everglades and seashores of Florida. It is only when viewing these minutely accurate maps that one can appreciate the overall work of the department.

P. V. Hitt looking up heirs to determine current ownership.

AFTER HOURS

The Detroit Marketing Division held its annual service award luncheon on June 21, in Detroit, Michigan.

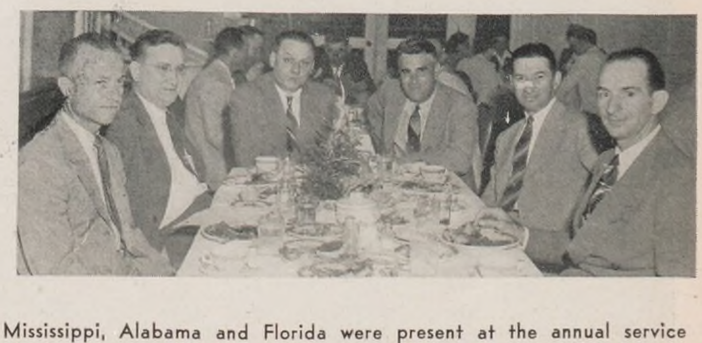
Autographed baseballs were presented to four veterans for whom this was the first award luncheon since their return. Standing in front, they are (left to right) H. Krass, B. Brusiee, L. Norton and E. Olewin. In back are Lyall Smith, Sports Editor of the Detroit Free Press, J. W. Southworth and Frank Shellenback who is coach of the Detroit Tigers.

San Antonio, Texas, was the scene of the annual dinner of the South Texas Ten-and-Over Club this spring. Club members came from Production, Gas-Gasoline, Exploration and Land Departments in every section of the Texas-Gulf coast area. This year the club has 22 new ten-year members, including two who are still away on military leave.

Members of the Atlanta Marketing Division enjoyed an informal day's outing at the Shell Southerners picnic on May 30.

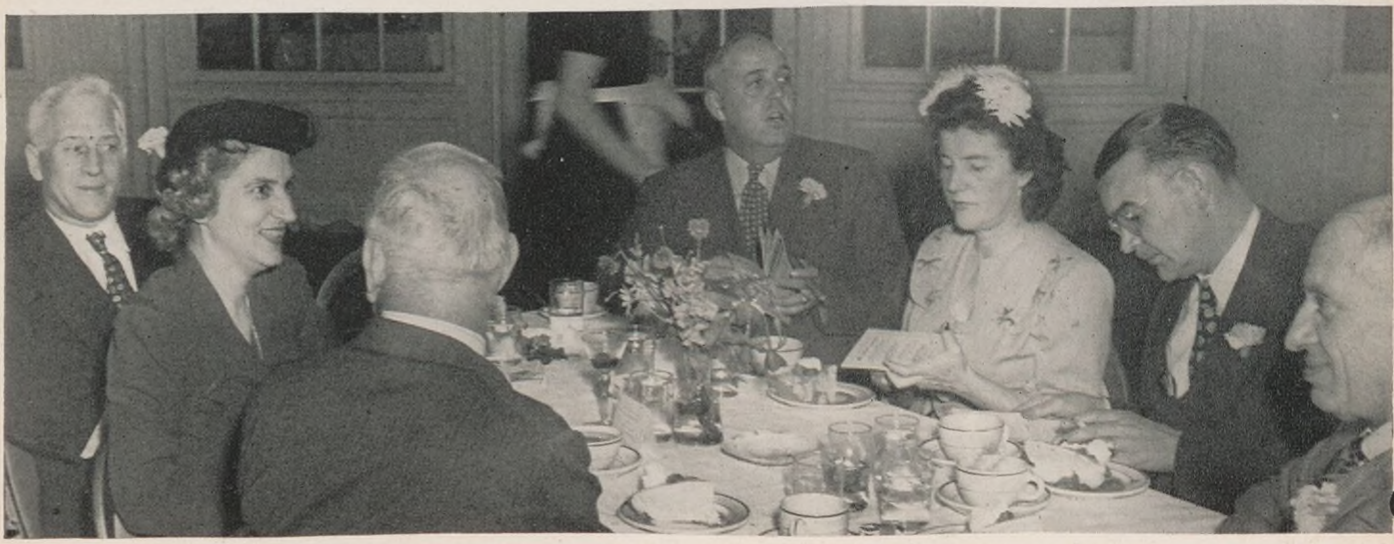
The Minneapolis Marketing Division held a service award dinner this spring for employees at Rock Island, Illinois.

At Kilgore's annual Ten-and-Over dinner in late spring, A. J. Galloway was one of the guest speakers.



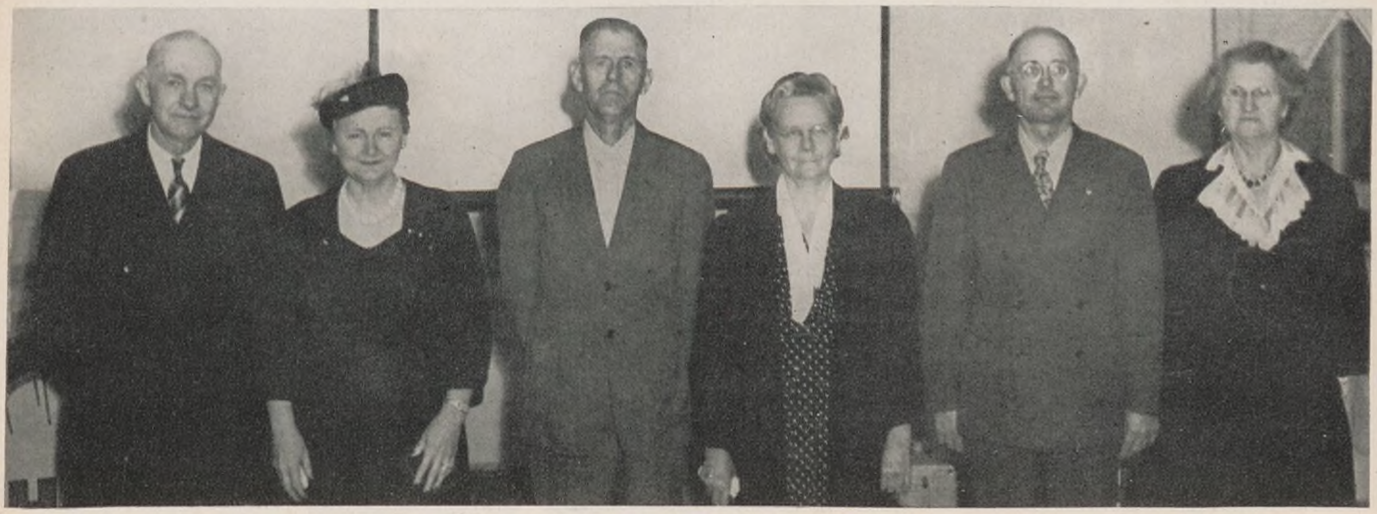
Thirty Ten-and-Over members of the Exploration and Land Departments in Mississippi, Alabama and Florida were present at the annual service dinner in Biloxi, Miss. Previously the number of employees east of the Mississippi was too small or too widely separated to make it possible to hold a meeting at one place for the entire group. (left) H. W. Hughes, A. C. Moss, J. O. Phillips, William Johnson, Glenn Byers, J. W. Sutton, E. Stevens, S. Harrison, W. F. Breeding. (right) C. W. Fisher, F. J. Nicholson, P. V. Hitt, J. C. Schwartz, M. L. Kerlin, P. P. Guizerix.

Members of the BOSTON MARKETING DIVISION recently attended the annual dinner given for those with 10 or more years of service. (Above, left) All of the employees in this picture reached their 17th service birthday during 1946. (Upper right) Gibson Miller celebrates his 10th anniversary with Shell by cutting the cake while George Frye looks on from the rear. (Left) Seated at one of the tables are (left to right) George Kenney, Fred Farley, Mary Barrett, Ed Jones, Frank Sullivan. Mary Grennan and Joe Halligan have their backs to the camera. (Below) About to start on dessert are (left to right) Bill Fredette, Betty Hanley, Charlie Anderson, Jack Dodge, Mary Walsh, Tom Nagle and Walter Woodward. It looks good, too.



Albany Marketing Division employees who celebrated their 10th service birthday this year were honored at this recent award dinner in Albany.

A total of 3,372 employees was present at the 1946 series of service award meetings in the Mid-Continent Area. The largest group to receive awards attended the Perry, Oklahoma party (left) where 506 Shell people gathered to honor 21 fellow workers who represent 420 years of service with the Company. At the Great Bend, Kansas, meeting (right) was seen the greatest number of returned servicemen to attend any one of the 18 parties. Several retired members of the Shell family attended the Healdton, Oklahoma, employees' get-together with their wives (Below, left to right) are Mr. and Mrs. W. D. Simmons, Mr. and Mrs. B. E. Stewart and Mr. and Mrs. W. T. Cooper.



VETERANS WHO HAVE RETURNED

ST. LOUIS MARKETING DIVISION


E. R. SHUTZ
Gen. Ledger-Stat. Sect.


L. R. DAVIS
Accounting Dept.


M. E. McCARTY
Operations Dept.


W. E. WALSH, JR.
Fuel Oil Dept.


E. W. THOMAS
Marketing Service

SHELL PIPE LINE CORPORATION


T. C. LaGREE
Newton, Kans.


F. C. MOTTERT
Oetters, Mo.


C. H. DAWES
Chelsea, Okla.


J. B. YODER
Hobbs, N. M.


R. E. WEEKS
Arkansas City, Kans.


B. L. UNDERWOOD
Union, Mo.


G. C. LANEY
Chelsea, Okla.


W. HALE, JR.
Denver City, Tex.


E. C. DEAN
McCamey, Tex.


H. O. BENGSTON
Newton, Kans.

HEAD OFFICE


HELEN C. PETRIE
T & S Department


JOHN O'DEA
Mktg.-Special Prod.


H. WILLIAMS
Treas.-Office Service


H. B. DONNELL
Mktg.- Plant Auto.


K. J. BREIDECKER
Treas.-Prod. & Refy. Acctg.

Left: RHYS REES and BROOKS MORGAN (standing), Manufacturing.

Right, l. to r.: PERNIN POTTS, J. S. SMITH and H. J. STOCKMAN, all of Mktg.-Lubricants.

BOSTON MARKETING DIVISION


R. E. CARNEY, JR.
Area Sales Clerk at Worcester, Massachusetts

W. D. BROADWELL
District Service Representative, Metro Boston District


W. J. McDONOUGH
District Service Representative, Metro Boston District

SERVICE BIRTHDAYS

TWENTY-FIVE YEARS

J. CLINGAN
Texas-Gulf Area
Production

R. L. TREPAGNIER
Norco Refinery
Topping

A. G. VASSEUR
Mid-Continent Area
Production

TWENTY YEARS

A. F. ANDREWS
East Chicago, Ind.
Products Pipe Line

E. D. ARCHER
Mid-Continent Area
Production

E. W. BACKS
East Chicago, Ind.
Products Pipe Line

R. L. BAILEY
Mid-Continent Area
Production

C. L. BASTION
Mid-Continent Area
Production

R. L. CANADAY
Vandalia, Ill.
Products Pipe Line

H. L. COLLAR
Cleveland Division
Marketing

C. E. EDWARDS
Mid-Continent Area
Production

E. J. GELPI
Norco Refinery
Engineering

D. R. GRANTHAM
Bayou System
Shell Pipe Line Corp.

E. V. HANSON
Texas-Gulf Area
Production

O. H. HANYKA
Texas-Gulf Area
Gas-gasoline

H. HARDEBECK
East Chicago, Ind.
Products Pipe Line

W. E. HARRIS
Wood River Refinery
Automotive

R. M. HESS
Texas-Gulf Area
Production

J. E. JOHNS
Wood River Refinery
Engineering

O. J. KELLER
East Chicago, Ind.
Products Pipe Line

W. J. KINGSLEY
East Chicago, Ind.
Products Pipe Line

F. J. KOESTERS
Indianapolis Division
Marketing

O. R. LITTLE
Mid-Continent Area
Production

R. H. MACKAY
East Chicago, Ind.
Products Pipe Line

W. S. MANTLE
St. Louis Division
Marketing

M. M. MASON
Texas-Gulf Area
Production

D. F. McELDERRY
Cleveland Division
Marketing

J. F. McKINLAY
West Texas Area
Shell Pipe Line Corp.

P. MIKULIN
Wood River Refinery
Cracking

M. R. MINTER
East Chicago, Ind.
Products Pipe Line

J. F. MONTZ, JR.
Norco Refinery
Topping

R. W. SHEEHY
St. Louis Division
Marketing

N. C. SIMMONS
Mid-Continent Area
Shell Pipe Line Corp.

H. E. SPENCER
Barnett, Ill.
Products Pipe Line

M. SPIVAK
East Chicago, Ind.
Products Pipe Line

R. F. STOOPS
Mid-Continent Area
Production

W. WEBER
Norco Refinery
Engineering

I. D. YODER
East Chicago, Ind.
Products Pipe Line

HEAD OFFICE

15 years

D. V. BURKE	SHUTTLE GROUP
A. T. DOANE	MARKETING
MISS G. M. FALOTICO	TREASURY
R. C. HARTMANN	MARKETING
B. M. ZANGER	TREASURY

SHELL PIPE LINE CORPORATION

15 years

C. J. ALMQUIST	TEXAS-GULF AREA
L. T. DOOLEY	MID-CONTINENT AREA
O. W. HEYDEN	HEAD OFFICE
W. SAVOY	TEXAS-GULF AREA

10 years

R. O. BUIE	TEXAS-GULF AREA
C. G. FAULKNER	WEST TEXAS AREA
J. A. GREEN	MID-CONTINENT AREA
P. H. McDOUGAL	BAYOU PIPE LINE SYSTEM

SHELL AMERICAN PETROLEUM COMPANY

10 years

WM. E. LEEDY	KOKOMO, IND.

PRODUCTS PIPE LINE

15 years

L. W. SCOTT	KNOXVILLE, TENN., TERMINAL

10 years

E. V. RECTOR	ZIONSVILLE, IND., DIVISION OFFICE

HOUSTON REFINERY

15 years

FRANK DUNGEN	ENGINEERING FIELD

10 years

E. BICKLEY	BOILER & POWERHOUSE
A. CONETT	LOADING & UNLOADING
S. E. CROUCHER	ENGINEERING
R. H. DIAMOND	TOPPING
J. C. DORSEY	AUTOMOTIVE
E. L. GREEN	ENGINEERING
J. P. HADDOX, JR.	CRACKING
V. V. KARNEY	AUTOMOTIVE
L. H. McDONALD	UTILITIES
M. McGHEE	ENGINEERING
J. A. NELSON	TOPPING
W. B. READ, JR.	ENGINEERING
J. H. SMITH	ENGINEERING

NORCO REFINERY

10 years

C. F. BOUDREAUX	ENGINEERING

WOOD RIVER REFINERY

15 years

J. H. ANDERSON	ENGINEERING
C. E. ARBUTHNOT	RESEARCH LABORATORY
A. CREMENS	ENGINEERING
J. B. GERARD	CRACKING
G. C. HEDGES	CRACKING

10 years

W. F. COLEMAN	ENGINEERING
F. C. GUNTER	CRACKING CLEANOUT
N. E. KRUSE	LUBE C. & S.
L. V. LADENDORFF	GAS
C. O. SCHLIEPER	ENGINEERING

TEXAS-GULF EXPLORATION & PRODUCTION AREA

15 years

R. A. TODD	PRODUCTION

10 years

C. V. ANDERSON	GAS-GASOLINE
A. T. BLANCHARD	PRODUCTION
G. D. BRAY	PRODUCTION
G. O. HULT	GAS-GASOLINE
J. O. JONES	LAND
J. T. JORDAN	GAS-GASOLINE
G. E. LEDBETTER	TREASURY-ACCOUNTING
S. W. LOWMAN	EXPLORATION
A. T. MANNING	PRODUCTION
L. A. NALL	EXPLORATION
J. M. ROBERTS	EXPLORATION
T. ROZSA	EXPLORATION
S. R. SAY	EXPLORATION
J. J. SINITIERRE	LAND
A. J. K. SMITH	LEGAL
I. M. STALLONES	PRODUCTION
D. L. VEASEY	PRODUCTION

MID-CONTINENT EXPLORATION & PROD. AREA

15 years

F. O. BIRKS	PRODUCTION

10 years

H. O. ABBOTT	PRODUCTION
E. N. DURHAM	PRODUCTION
W. J. FREUDIGER	PRODUCTION
J. D. JENNINGS	PRODUCTION
C. T. LACY	PRODUCTION
W. V. NORRIS	PRODUCTION
V. L. RAGSDALE	TREASURY
R. SPARKS	PRODUCTION

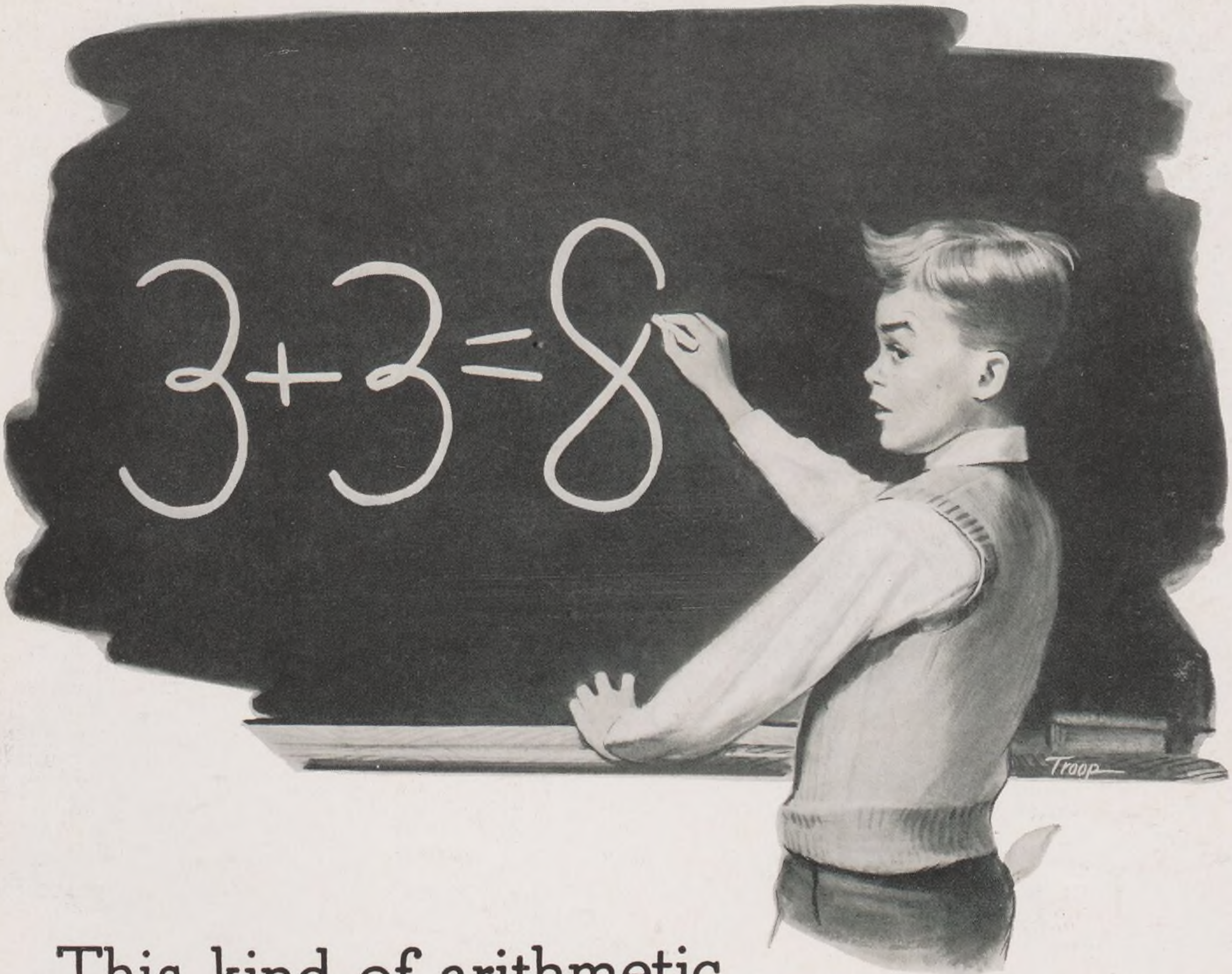
MARKETING DIVISIONS

15 years

C. M. GREER	ATLANTA, TREASURY
H. K. HAEFFNER	ATLANTA, TREASURY
G. H. SMITH	ATLANTA, MARKETING SERVICE
J. F. McDONOUGH	BALTIMORE, OPERATIONS
W. J. FORBES	BOSTON, TREASURY
J. W. MORTON	BOSTON, OPERATIONS
C. A. RIZZO	BOSTON, TREASURY
R. E. OSTERTHALER	CLEVELAND MARKETING SERVICE
M. R. REITZ	CLEVELAND, SALES
R. G. SEES	CLEVELAND, TREASURY
J. SARGENT	DETROIT, MARKETING
G. A. HARSHMAN	INDIANAPOLIS, SHELLANE
E. C. BRANDEWIEDE	ST. LOUIS, TREASURY

10 years

M. R. BOUDETTE	BOSTON, SALES
E. J. COLLINS	BOSTON, OPERATIONS
E. W. LISK	CLEVELAND, OPERATIONS
R. T. MALONE	CLEVELAND, OPERATIONS
R. J. REPPENHAGEN	CLEVELAND, OPERATIONS
J. STAPLES	DETROIT, OPERATIONS


3+3=8
Troop

Warts in Paradise

IN THE FIELD OF AGRICULTURE, petroleum research makes major contributions to the science of food production.

For example, Hawaiian pineapples are subjeet to attack by microscopic worms—nematodes—which cause a wartlike growth on the plant roots. Growers appealed to Shell scientists who had developed petroleum derivatives available nowhere else.

Shell Research produced a certain chlorinated hydrocarbon, later named "D-D"*. When injected in the soil it killed the parasites so effectively that the menace in the experimental area was brought under control. That was 5 years ago. Today, with war needs fulfilled, D-D production proceeds full speed to lift the plague not only in Hawaii, but in many other parts of the world infested with nematodes.

Such research, making petroleum serve mankind in more ways, adds to the growing prestige of the oil industry.

*Trade Mark Registered U. S. Patent Office

SHELL

Horizons widen through Shell Research

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