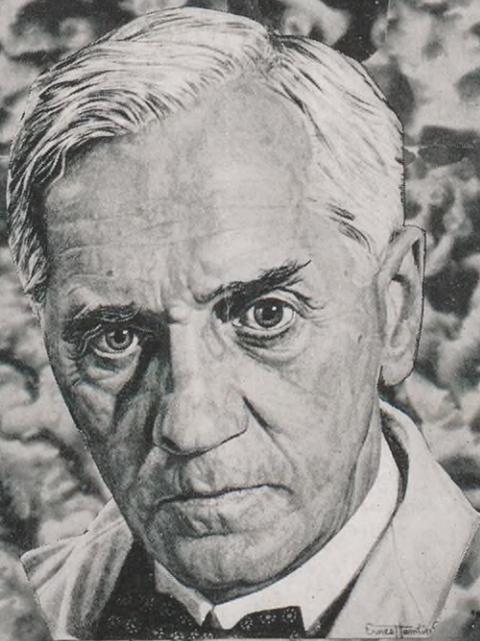
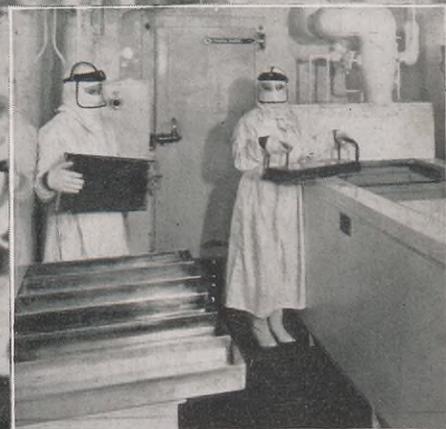


SHELL NEWS



APRIL • 1945

matters of

Fact



**During 1944 Shell employees (East of the Rockies)
worked more than**

34 MILLION MANHOURS

In that period there were

284

disabling injuries, or an average of approximately

8

injuries for each million manhours.

**During the previous year the average for the entire
petroleum industry was 13 for each million manhours.**

Let's Reduce Injuries in 1945

SHELL NEWS

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

APRIL • 1945

VOL. 13 • No. 4

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This plain box contains a great drug, penicillin. Each of these glass containers holds 100,000 units . . . enough in many cases to cure a disease and perhaps to save a life. The white object in the center is a cigarette, put there to give you an idea of the size of a penicillin capsule. On page 2 is the story of how Shell's scientists developed a process for the recovery of this vital drug . . . an achievement far removed from the field of petroleum.

The cover: Dr. Alexander Fleming; an ampoule of penicillin; and scenes of manufacturing operations; on a background of the parent mold of penicillin . . . penicillium notatum.

THIS ISSUE

"Penicillin . . . Now It Can Be Told" on page 2 is the story referred to in the Shell Spotlight above. The newly created Central Aviation Department—New York—is the subject of this month's Speaking of People, page 7. "Land of Contrasts" is not a tall tale of Texas even though it tells of cattle strangled by mosquitoes; for a fabulous story of a fabulous state see pages 11 to 13. The Shell Union Annual Report is graphically presented on pages 14 through 17. The latter two pages summarize the report in drawings which give you a quick glance at your Company's twelve-months' report.

Cover drawing of Dr. Fleming reproduced with permission of Time Magazine. Photographs on cover from Schenley Laboratories.

PENICILLIN



Now it can be told

by M. Reville

PROBABLY the last place in the world that one would expect to find Shell chemists and engineers would be in great plants devoted to the culture and feeding of molds. But that is where you will find them when those molds are of the strain known to scientists as *Penicillium notatum*, source of the new miracle drug—penicillin. It is quite a story!

Of all the marvels which the second World War has brought to light, none is more striking than the manufacture on a gigantic scale of this life-giving drug. Buried in medical journals as a laboratory curiosity for years before Pearl Harbor, penicillin is now a household word. American productive genius has performed another wartime miracle and in the course of a few short years has provided its fighting men and civilians alike with history's most potent weapon in the unending fight against-disease. But before discussing this magnificent achievement, and the part played in it by the men of Shell, let us look back briefly to a small medical laboratory in London, England, in 1928 . . .

Dr. Alexander Fleming, a professor of bacteriology at St. Mary's Medical School at the University of London, was experimenting with staphylococci—germs

which cause boils and abscesses and infect open wounds. In order to test his germicidal, or germ-killing, preparations, he was growing healthy germ colonies under favorable living conditions in flat culture dishes. One morning he discovered that in some way a green mold had formed in the jelly-like culture in some of his dishes, and that in these dishes the growth of the staphylococci had been very seriously affected—the germs were, as a matter of fact, in extremely poor condition.

Looking back into old laboratory records it has been found that this was by no means a new experience. In fact, more than one text-book on bacteriology warned experimenters to take precautions against molds if healthy bacteria were desired, and many respected bacteriologists had thrown away culture plates ruined by molds. But not Dr. Fleming. He quickly lost interest in the welfare of his staphylococci and turned his full attention to the mold. Obvious? Well, perhaps—but on Dr. Fleming's decision hinged the health and welfare of millions in the years to follow.

Years of patient, often disappointing, research ensued as Dr. Fleming turned from bacteriology, the study of bacteria, to mycology, the science of molds, and sought

to learn the nature and habits of what was to become the greatest enemy of many bacteria—of the staphylococci with which he had worked; of the pneumococci which cause pneumonia; of streptococci, the source of fatal infections of the throat; and many others. He identified the germicidal mold as *Penicillium notatum*, so named because of the pencil-like shape of its spores; and finding that its effect was due to a chemical secreted during growth, named that unknown chemical—penicillin!

Dr. Fleming's work kindled the enthusiasm of other scientists including Dr. Howard F. Florey of Oxford University who launched an extensive research program to study methods of mold growth on a large scale. Here again disappointment followed disappointment. No matter how well the mold was nurtured and fed, even though it could be made to thrive in special food mixtures until it became a bulky, wrinkled, glistening mass, it could not be made to yield the magic substance in more than microscopic amounts. The researchers found the most favorable temperature—about 75 degrees Fahrenheit—supplied the mold with plenty of fresh air, sterilized the air with ultra-violet light and took every imaginable antiseptic precaution but they could not get the mold to produce a "broth" which contained more than about 50 parts of penicillin per million parts of culture solution.

Not only this—but at the same time that the mold secreted penicillin it also produced impurities which were harmful on injection. And still worse—when any of the known methods were used to purify the penicillin and to extract it from the tremendous amount of liquid in which it was contained, the priceless drug was rapidly destroyed, so that only a fraction of the meager 50 parts per million was recovered for medical use.

Despite these serious handicaps, American industry tackled the production job that has become one of the epics of the war. Buildings were erected to house millions of the small flasks in which Fleming and Florey had perfected their mold-growing technique. Later huge vats holding tons of green mold, agitated by streams of sterile air, came into the picture, and one great plant was equipped with fifty huge rotating kilns in which the mold was grown on bran. The production of specially purified and enriched feed liquor became tank-car business. Thousands, and then millions of gallons of filtered fermentation "broth" containing impure penicillin flowed from the bottles, from the vats and from the percolators in which it was washed from bran.

And here again, as in the case of Fleming and Florey—and in spite of all that modern ingenuity could do—the sad story was repeated. In purifying the penicillin from the toxic impurities associated with it in the



Penicillin is subjected to routine tests for potency. The diameter of the clear circle around each test sample is the measure of its value. Dr. Fleming first discovered penicillin's germ-killing action in similar plates.

Before being passed as acceptable for human use, every batch of penicillin is tested on rabbits. Much care is given to the health of these test animals; on their reactions may depend the lives of many soldiers on our battlefronts.



Rabbits are sensitive to pyrogens (impurities which cause fever). In the standard pyrogen test, penicillin is injected into a rabbit's ear and the reactions are carefully watched. If a rabbit's temperature should rise more than one degree, the batch of penicillin is rejected.



"broth," and in the operations of recovering it in purified, stable crystal form, tragically large losses were incurred. Month after month, plant production figures reflected losses of 50% or more during recovery operations. Half and more of the vital penicillin, coaxed from the mold with such great pains, was being destroyed or lost in processing!

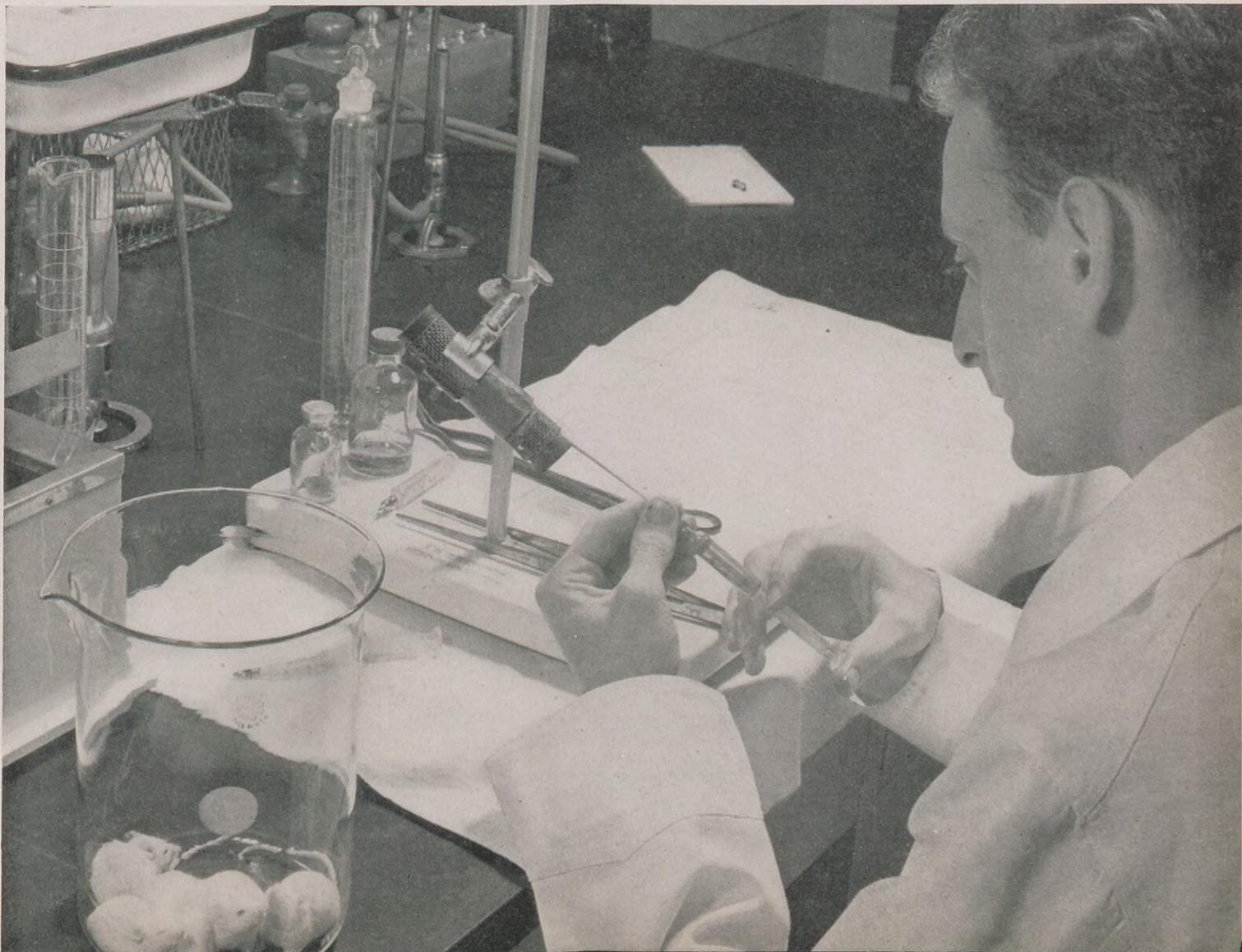
This was a job for experts in the field of extraction, and just at the time when things were at their blackest, with production taxed to the utmost to meet growing war demands, someone thought of Shell. Had not Shell Development been a pioneer in the use of solvent extraction for highgrade lubricating oils? Had not the Emeryville Laboratories developed extraction processes of major wartime importance in the manufacture of aviation gasoline, butadiene for synthetic rubber, and many vital wartime chemicals? Were not over 75% of the nation's plants for the manufacture of petroleum toluene for TNT

using the Shell Toluene Recovery Process? Perhaps Shell could use this experience in tackling the job of recovering penicillin.

Shell's response was immediate, and a group of technologists who were experts in this field were assigned to study the problem. The possibilities of applying advanced chemical engineering technique to this new problem were soon apparent, and in a matter of weeks a pilot plant embodying a radically new penicillin recovery process was in successful operation at Emeryville. This was operated on samples of broth rushed by refrigerated truck from the nearby Cutter Laboratories, producer of penicillin, and at the end of the fourth month of experimental work the Shell-developed process had yielded results which surpassed even the most optimistic expectations. It was ready for full-scale application.

Cutter Laboratories, which had worked in close collaboration with Emeryville, were the first to employ the

Mice are particularly susceptible to toxic impurities which cause pain or other unfavorable reactions after injection of penicillin. The most convenient vein in a mouse is in the tail. The standard test procedure uses a container of this type from which the tail protrudes.



new process on a commercial scale. Actual production figures are still regarded as information affecting national security and so may not be revealed, but it may be stated that current percentage recoveries in this unit are approximately double the national average prior to the development of the new Shell process. Not only that—but measured on the standard scale of bactericidal potency, the present Shell-purified penicillin is twice as powerful in its germ-killing action as that formerly produced by Cutter by conventional recovery methods. Four other penicillin producers soon followed suit and made arrangements for the installation of Shell penicillin recovery units.

The story of penicillin has been one of great achievement by individuals and organizations alike. Never be-

fore has a product of such vital importance to life and health been carried from the laboratory to mass production in such a short space of time. Today, less than five years after its manufacture was first considered, penicillin is being made on a scale far greater than was ever believed possible. The tremendous demands of several battlefields are being fully met and supplies are piling up in hospitals and drug stores for the use of civilians.

Thanks to penicillin, many of the most virulent diseases known to mankind are gradually being brought under control—and it all started when a doctor in a little laboratory did not throw away a culture plate which the mold had spoiled, but instead looked upon the mold with eyes that glimpsed a new gleam of light, the light of discovery!



A corner of the "vat room" at Cheplin Laboratories, Syracuse, New York. Operators control the conditions under which the mold is carefully grown for maximum yield of penicillin. The "broth" produced in these vats will later be purified and concentrated by means of the Shell Penicillin Recovery Process.

SPEAKING OF PEOPLE

these are the men and women who make the Central Aviation Department—New York—function. This is the fifth of a series telling in words and pictures how many of Shell's departments operate, what they do, and who does it.



R. T. "Doc" Goodwin, manager of the department.

THE scope of commercial aviation, even in wartime, is worldwide. Routes which formerly meant months of land and ocean travel now are covered by a few hours or days in the air. Grade school geographies used to dwell on the fact that the earth's circumference is 25,000 miles at the equator and estimate the time it would take a man to walk that distance. The tales of hardships endured by Magellan's and Drake's crews on the first trips around the world were historical legends for centuries before people dreamed of making the same journey by air . . . in complete comfort.

Even the most visionary spectator when the Wright Brothers made their flight at Kitty Hawk could not foresee air travel on its present scale. The planes of World War I were only shadows of today's aircraft. Clippers and airliners were yet to appear on designers' drawing boards. Looking back only a quarter of a century one has to give tremendous credit to the aviation industry (and to the petroleum industry, without which it could not function) for the great strides made in a short time. War production has worked miracles, and every day seemingly impossible improvements are made; factories of the United States are doing a job which, under less pressure, might have taken decades.

Aviation's prospects for the future . . . when bombers and fighters will no longer be in the limelight, when an

air-minded world will think of the huge transports which make possible an inter-country exchange of people and products . . . are limitless. It has been promised that in the very near future no spot will be more than 30 hours distant from any other place on the face of the earth. What can be expected beyond that depends upon the imagination of individuals . . . and the mechanical fulfillment of their imagination.

For this peacetime traffic Shell is building a solid framework now. The Head Office Aviation Department has become the Central Aviation Department—New York, known for brevity's sake as CADNY. Its field of operations is the Western Hemisphere, but most of its work shuttles to and from a group of desks on the 38th floor of New York's RCA Building.

With the change in name, the Department has taken on extra duties. It is the expeditor of all Shell's activities which relate in any way to aviation. It assists the Marketing sales staff by being up to date on technical improvements made by the Company and by Shell's customers. It maintains business contacts with all Shell associates in the Western Hemisphere and, through London or other offices, can negotiate with airlines and supply bases in the eastern half of the world.

In connection with these activities the Department

will act as a bureau of aviation information, collecting and arranging material on airport facilities throughout the world. This, however, is not an entirely new function; rather, it is the extension of a files system started before the war. Shell has maps of airports and installations all over the globe. It was particularly fortunate for the U. S. Government, at the outbreak of war with Japan, that this collection was so complete. Some of the maps were the only ones available in the U. S. which showed certain Japanese airports, and these were loaned to the government. They have been used, also, to aid airlines in plotting post-war routes. Along with their proposed route applications these companies had to file with the Civil Aeronautics Association cost estimates, showing proposed operating expenses. Shell helped with these, too, by supplying price scales for petroleum products at points all over the world.

Directing the activities of the Department is Dr. R. T. Goodwin. As a prelude to expansion of Shell's aviation plans in this hemisphere Goodwin, in 1941, made a trip through the Caribbean region to survey petroleum facilities. Since then he has made many short trips, increasing Shell's contacts. He, and the other members of CADNY, keep abreast of new developments in aviation, such as jet propulsion fuels and post-war fueling equipment. Those interests and frequent invitations to address aviation groups and engineering societies keep Goodwin flying about the country.

Assistant manager is J. S. Harris, who . . . when asked whether keeping abreast of Shell's aviation activities for an entire hemisphere isn't an awfully big job for a comparatively small department . . . reminds you that the Aviation Department is part of Shell's Market-



J. S. Harris, assistant manager, studies the large wall map in his office.

ing Department and that its main duty is to assist in the sale of aviation fuels and lubricants.

T. B. Rendel, Technical Assistant in CADNY, works closely with the Manufacturing Department, other Marketing departments, airlines, plane and engine manufacturers, and industry technical groups. He is chairman of the planning committee of the Cooperative Research Council (which represents all major oil companies, avia-



John Hopkins works closely with Goodwin and Harris.



T. B. Rendel supervises the technical work.



Jim Wheeler is one of the Company's two Aviation Supervisors.

tion industries and many large airlines). Rendel keeps fully informed on product development and product application, as well as engine testing techniques. His is a correlation job; he finds out what advancements are being made or should be made . . . and keeps aircraft engine manufacturers advised of developments, so they will improve engines to utilize petroleum's full power.

The work of CADNY is divided on the basis of the five major types of customers served: airlines, engine manufacturers, plane manufacturers, airports and the government.

J. C. Hopkins shares with Goodwin and Harris the responsibility for the Department's work with airlines; this includes domestic companies and also foreign groups coming into the country for supplies. He oversees supply arrangements with Shell's airline customers. Just recently



The other is Julian Freeman, at the controls of his Company plane.

Hopkins negotiated contracts for a group of planes being ferried between Canada and Brazil; through Shell's affiliates he made provision for fueling stops all along the line. This, of course, was a commercial flight, but in the future private flying between North and South America is expected to be an important factor in air travel.

An information section for questions on world air routes, airport facilities, local taxes and regulations, availability of products, prices, competitive conditions and other similar data is headed by Hopkins. Preparations are being made for its expansion, since at present it serves only the commercial field. To meet the inquiries which are sure to come Shell is readying this touring service for air travelers, similar to the one operated only for motorists.

G. H. Lyman's particular assignment deals with manu-



L. P. Pattison works on Army and Navy contracts.



George Chinsley with Grace Watters.

facturers who need aviation fuels for pre-flight testing operations of airplanes and engines. A Marketing Division may call Lyman and report a chance for new business. Before the war that opportunity would have had the go-ahead signal immediately; now it depends first upon the quantities of product which the manufacturer is allowed to purchase. In problems involving this question Lyman is the link between the Marketing Divisions, which have direct contact with these customers, and government agencies such as the Aviation Petroleum Products Allocation Committee, which say what and how much can be sold to these manufacturers. When this point is cleared Lyman checks the availability of supplies and asks Transportation and Supplies, Manufacturing or other Head Office departments, "Can we do it?" He puts all the answers together, determines whether a new account can be served, and then reports to the Division. In this same manner, gathering questions and answers from all sides, he assists in establishing selling prices and clearing purchase orders and contracts.

George Chinsley, a licensed pilot, has, as his main task, airport and flying school business. Through the Division representatives Chinsley recommends products for servicing private planes and helps sell Shell aviation fuel and lubricants to airport accounts. He assists the field by making presentations of brochures, pamphlets and other sales aids. Hopkins confers with the Advertising and Public Relations Departments on the over-all planning of this material; Chinsley then works with them and other departments, checking the details and facts. Some of this promotional material, including reprints of speeches by Dr. Goodwin and others, is distributed by mail to schools and other organizations wanting information about aviation problems. Thousands of requests for copies already have been received.

The Company, at present, has one airport service station for private planes . . . at LaGuardia Airport, New York. This unit is used by Chinsley as a proving ground for airport merchandising ideas.

L. P. Pattison spends a great part of his time in contact with Uncle Sam. He knows all the ins and outs of military contract procedure. This knowledge is put to good use in his dealings with the Army Air Forces at Wright and Patterson Fields in Dayton, Ohio, and with the Navy Department in Washington. The Petroleum Administrator for War determines how much of the government's military aviation fuel needs are to be supplied by Shell, and Pattison makes arrangements with PAW, through Shell's Transportation and Supplies Department, on this and other problems. It is up to him to keep track of shipments, check them with allocation figures . . . and be sure that Shell supplies its monthly share of the military requirements.

The real travelers of the Aviation Department are the Aviation Supervisors, Jim Wheeler and Julian Freeman . . . each of whom pilots a Howard DGA-15 airplane. They are Shell aviation in the air, going from one Marketing Division to another in their specific territories and making day-to-day contacts with the Army and Navy, commercial and private customers, prospects and service supervisors. They bring the latest news from CADNY to the field. When the Divisions want support in making a sales call they can count on Wheeler or Freeman.

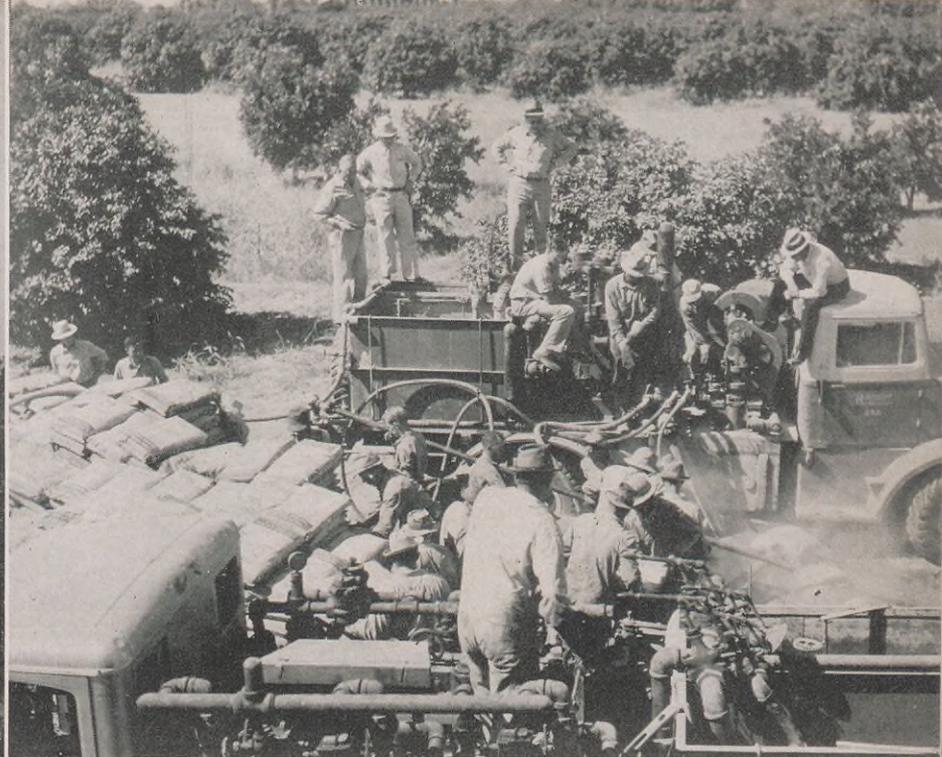
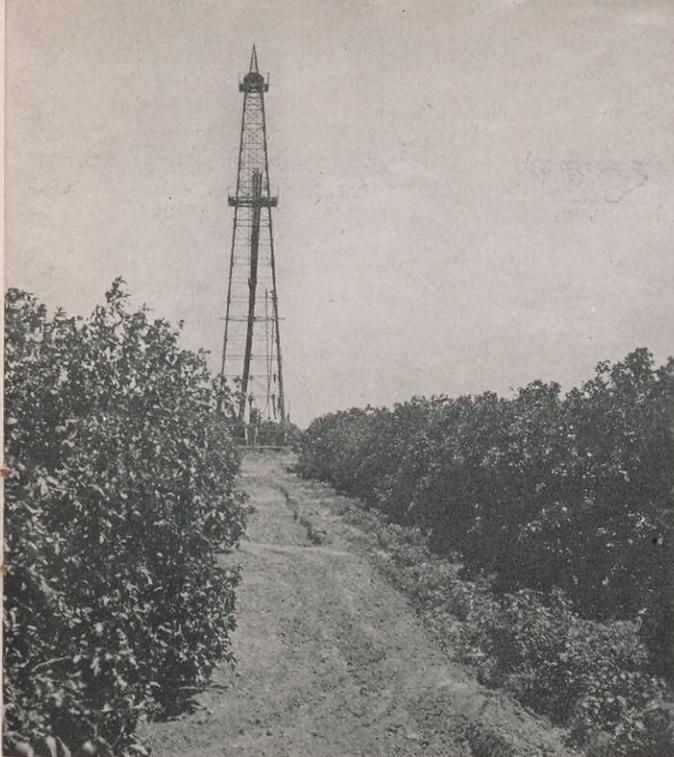
Assistant Aviation Supervisors work on aviation problems in each Division, where they are responsible for the furtherance of Shell's position in aviation. The Aviation Department as a unit primarily acts in a consultant capacity; its functions are educational as well as promotional. Its keynote is coordination . . . its watchword the future.



Ann Morabito, Secretary to Goodwin.



George Lyman with Othelia Nilsson.



In the Valley, one of the Division's extremes in climate and terrain, it is not unusual to see a derrick among the orange trees. At the right, workers cement a well in the center of a grove.

LAND OF CONTRASTS

by *W. E. Owen* (Texas Gulf Area)

EXTENDING from the Texas-Louisiana state line to the Mexican Border—a long way even in Texas, where people are casual about distance—the Production Department's South Texas Division sprawls across sixty-six counties, embracing an area of some 68,000 square miles bordering the Gulf of Mexico. From one end of the Division to the other is farther than the distance between Washington and Detroit, and the territory it includes exceeds the combined areas of all of the New England States.

As you might expect in a territory of such magnitude, marked changes in both climate and people can be noted between one end of the Division and the other. In the Beaumont-Port Arthur area the climate is humid, the terrain is swampy and crossed with bayous; and huge oak and magnolia trees festooned with Spanish moss create an atmosphere of the story-book South. A large percentage of the population here is of French extraction, having spilled over from the French settlements in Louisiana.

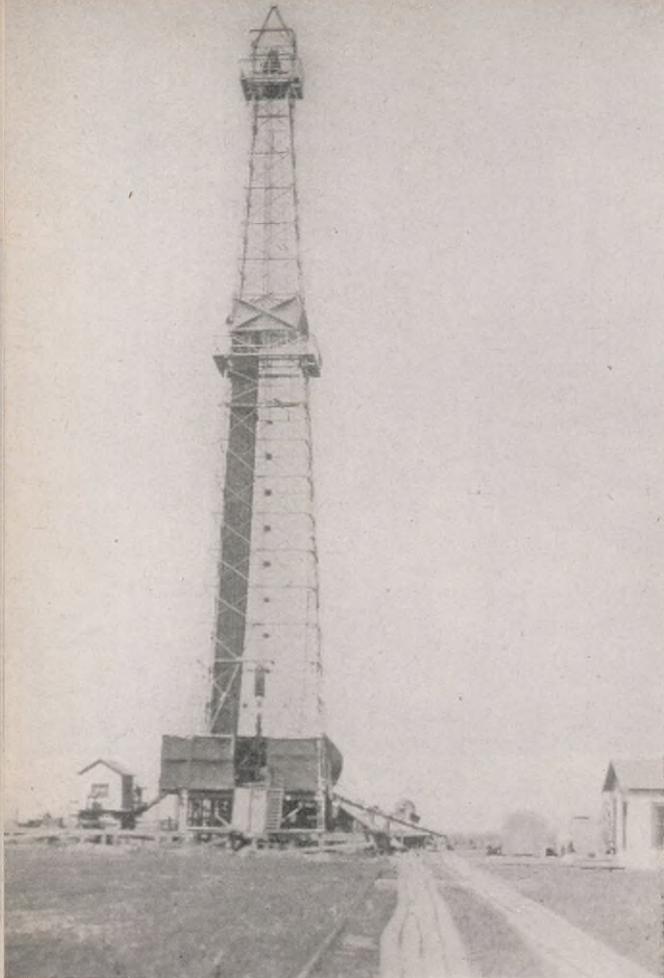
This coastal region provides excellent duck and geese hunting during the fall and winter, but in some of the summer months mosquitoes present a real problem. On one large coastal ranch under lease to Shell, the owners have found it necessary to move their cattle inland during the summer, for the cattle breathe mosquitoes and actually

have been known to strangle as a result. Off the coast from Port Arthur to Corpus Christi, the waters of the Gulf of Mexico are a paradise for surf and deep sea fishermen, although the activities of fishing enthusiasts have been restricted somewhat since the beginning of the war by Coast Guard regulations necessary for national safety.

Lying to the north of the coastal swamps, a pine-tree belt extends westward well beyond Houston and provides a rich source for lumber and paper mills. These pine forests abound with squirrel, armadillo, and herds of hogs which have been allowed to run wild and forage for themselves for so long that they now resemble wild boars both in appearance and in temperament. Numerous small streams drain this timbered country and are well stocked with bass and other game fish to tempt the followers of Izaak Walton.

Westward toward San Antonio the topography rises, and the pine trees which predominate in the eastern part of the Division are replaced by oaks and brush. This neighborhood is one of the foremost cattle-raising sections of the state, and many of the country's finest show herds can be found here. Wild game, particularly white-tailed deer, quail and doves, is plentiful in this region.

To the south, a vast semi-arid desert extends from Corpus Christi to the Rio Grande Valley. Broken only by



Port Acres, in Southeast Texas, is another story. On the left is a location on land which can be reached only by water. Above a truck loaded with cement is being hauled to the location by barge.

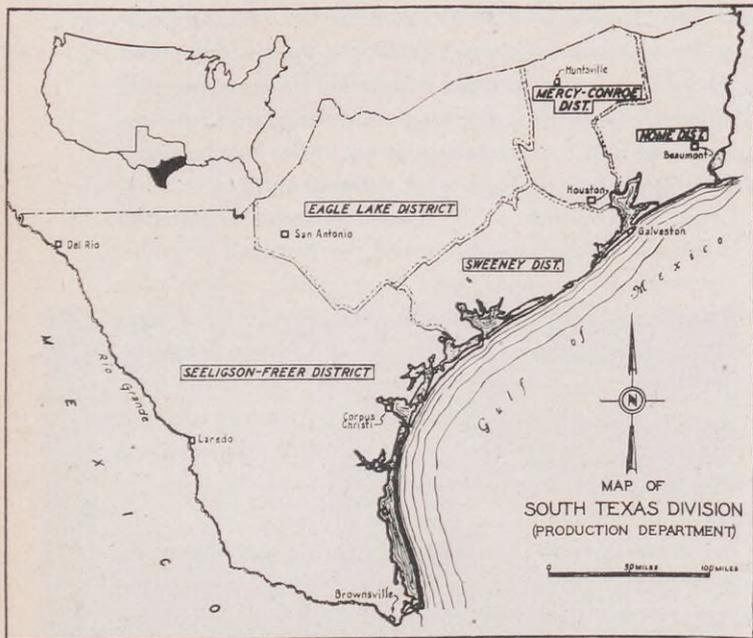
occasional patches of irrigated cultivation, this country is a seemingly limitless expanse of cactus and mesquite peopled largely by Mexicans, some of whom live on land grants made when Texas was under Spanish rule. The famous King Ranch, larger than some Eastern states, is located here, and covers most of three counties with an area of about 1,800 square miles. This ranch is governed like a feudal domain by one family, and ingress is almost impossible to the stranger; not until recently was the building of a State highway through its lands permitted.

A multitude of game animals inhabit this desert wilderness, and favorite sports of the locality include bobcat and coyote hunts, which are usually conducted on horseback using packs of dogs.

In the southernmost part of the Division lies the fertile Rio Grande Valley, a land of perpetual summer that is farther south than Cairo, Egypt, and which is one of the foremost citrus-growing and truck-gardening regions of the country. Here Spanish is spoken almost as frequently as English, and the cities of the area provide a clearing house for a thriving Border trade.

Labor for the truck farms and orange groves is drawn chiefly from the Mexicans, who live a carefree life and cling to many of their old-time customs. In Shell's Seeligson District camp it is not unusual for the residents to be serenaded by groups of Mexican musicians during festive holidays.

With such varied conditions existing through the Division, it is to be expected that Shell's operations are extremely diversified, and that an operating method applicable in one field district of the Division would be unsuited to the conditions prevailing in another. To surmount such difficulties, authority is so decentralized that each of the districts shown on the map of the Division



Stretching from the Sabine River to the Rio Grande, the Division includes five districts. Their location in relation to the cities of South Texas is shown on the map above.

(page 12) is made an autonomous unit insofar as it is possible, and is under the supervision of a district production superintendent, who applies methods best suited to peculiar demands of his district.

A district exploitation engineer and district clerk work under this superintendent, and these three men have the primary responsibility for properly drilling and completing wells in the district. When Company tools are used for drilling, the staff also includes a drilling foreman.

After the discovery of a new field, responsibility for development falls to the Production Department. Production matters arising after a well is completed are handled by a production foreman, who supervises both the roustabout gangs and the switchers who are responsible for producing the daily allowable for each well.

Problems of the several field districts are studied and collated in the Division office by the staff: exploitation engineering under the guidance of the Division exploitation engineer, his assistant, and specialists in subsurface and production petroleum engineering; mechanical engineering under the Division mechanical engineer; and the chief clerk for accounting, personnel, and other administrative requirements.

In addition to their work with routine problems from the districts, these men are responsible for keeping the districts informed on new methods, operating techniques, and equipment.

The Division's entire personnel is under the supervision of Division Manager E. C. Lawry, who will shortly commence his twenty-fourth year of service with the Company. The Division's total payroll now numbers 226 employees, in addition to 39 on military leave.

Shell's stake in the South Texas Division is large and is growing rapidly. At the present time, the Company owns 440 full-interest and partnership wells in the Division, representing an investment of many millions of dollars and producing in some 36 different fields from depths

ranging between 2,000 and 11,000 feet. Production from these wells now averages over 18,000 barrels of oil daily, which is transported by pipe line, or in some cases by barge or tank car, to a refining center.

The chief refineries drawing on the Division for crude are in Corpus Christi, the Beaumont-Port Arthur area, and in and adjacent to Houston, where one of Shell's refineries is situated.

At present, active drilling operations are in progress on nine Shell full-interest wells and two partnership wells in the Division. Both Company-owned drilling rigs, as well as those of independent drilling contractors, are employed for this work. Contract prices for drilling wells vary according to locality and depth, and costs range between \$25,000 for a comparatively shallow well (6,000 feet) in an accessible locality and \$250,000 for a 12,000-foot wildcat. Well costs may be greatly affected by topographic conditions at the well site; Shell is now drilling a wildcat in marshy territory southwest of Houston which required a \$75,000 road before a drilling rig could be moved onto the location.

As most of the shallower development prospects have been drilled up, ever-increasing depths have been reached in the search for new fields, requiring the use of the heaviest type of drilling equipment. One of the deepest wells on the Gulf Coast was drilled by Shell in 1944 in the Mercy field fifty miles north of Houston, and reached a depth of 14,004 feet to establish a new depth record for Shell in the Texas-Gulf Area.

The so-called "Wilcox trend," a thick sandstone series of Eocene Age, passes through the South Texas Division, extending from west of Corpus Christi northeastward into Louisiana, and in addition to being a promising potential oil reservoir, is one of the greatest potential gas sources in the United States.

In one field on this trend (Sheridan) Shell is undertaking its first full-scale gas cycling operation, whereby gas will be drawn from the Wilcox sand members from depths down to nearly 11,000 feet, stripped of its liquid hydrocarbons at a central plant, and injected into the producing formation in a dry form. The cycling plant will go into operation within the next few months, and will greatly increase production from the Division.

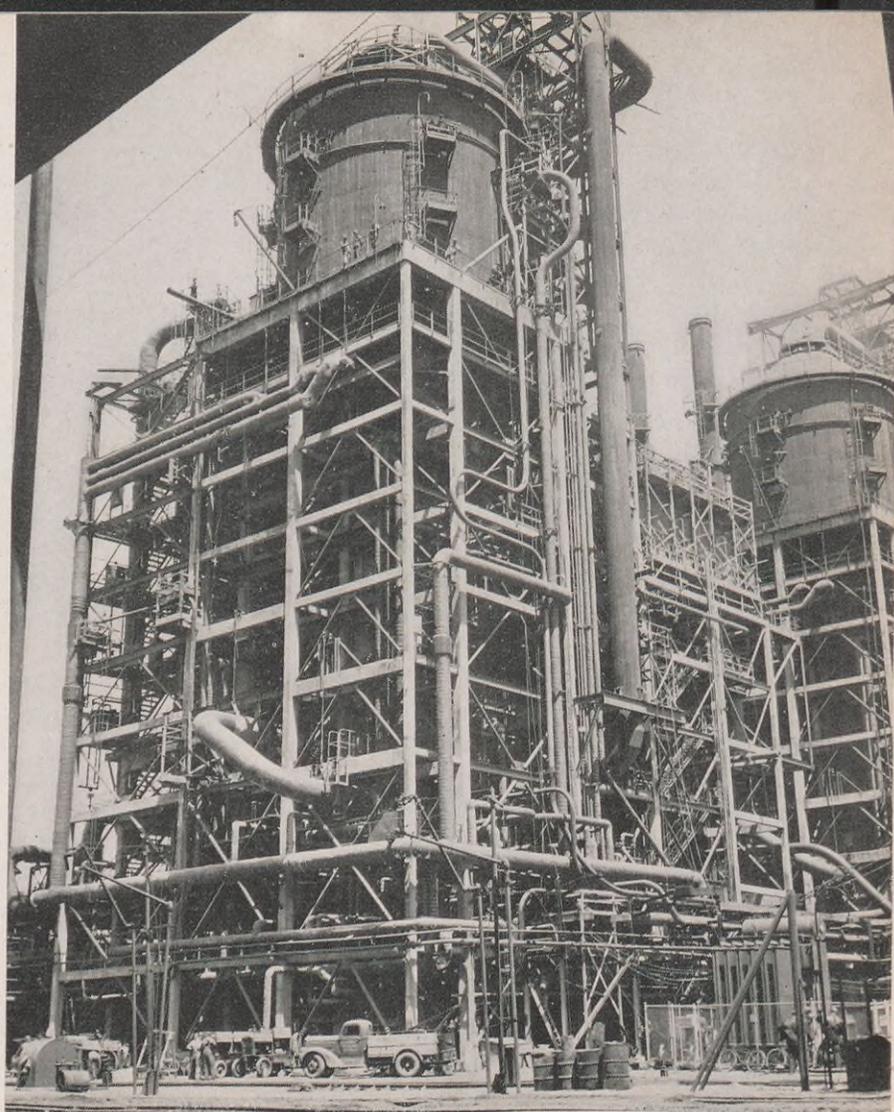
The territory covered by the South Texas Division is of tremendous strategic importance as a source of oil for the war effort, and currently produces (for all oil companies in the area) about 300,000,000 barrels of oil annually, representing 12 per cent of the entire world's production, or almost as much as the combined production of all of South America and Mexico. Shell is proud of its part in this program, and every member of the South Texas Division realizes that his efforts are helping to shorten the war.



South Texas Division's Story Launch, which carries workers to and from Port Acres location.

SHELL'S FINANCIAL REPORT FOR 1944

The twin catalytic crackers at Wood River Refinery have been in operation for a year. Plans have been completed for the construction of a similar "cat" cracker at Houston Refinery.



THE 23rd annual report of Shell Union Oil Corporation and its subsidiary companies was issued on March 28th. The report showed that the net earnings during 1944 for Shell Union and its subsidiaries amounted to \$28,163,961. Dividends amounting to \$20,205,938 were paid to stockholders.

MANUFACTURING

An outstanding feature of the Company's war production during the year was an increase of 80% in the output of 100-octane aviation gasoline. The Company manufactured 13% of the total national production of this most vital military product.

The original aviation fuel plant expansion program planned in 1943 has now been completed. Shell has in operation three large catalytic cracking installations, isomerization and alkylation plants, hydrogenation units and auxiliary facilities at Wood River (Illinois) and Wilmington (California) Refineries. Toward the end of 1944 plans were completed for the construction of a large new catalytic cracking installation at the Houston (Texas) Refinery, which will add substantially to the Company's capacity for producing aviation fuel.

EXPLORATION AND PRODUCTION

At the end of the year the Company's proved underground reserves of crude were about the same as at the beginning of the year. It is an industry practice to take a conservative figure in estimating reserves; when new wells are drilled figures are revised accordingly. Thus the major part of the offset to last year's withdrawals consists of revisions of the reserve estimates of production areas discovered in prior years. During the past year the Company's net production of crude was over 72 million barrels as compared with slightly less than 68 million in 1943. At the end of the year Shell owned outright 6839 oil wells and, in conjunction with other companies, owned an additional 1780.

The never-ending search for new reserves of crude oil continued during the year, but were intensified to meet the demands of the war. Although the possibilities for uncovering new fields are still extensive, nevertheless, as the areas of possible production are thoroughly combed over, it becomes increasingly difficult to discover these fields.

PIPE LINES

At the end of 1944, Shell's crude and products pipe lines totaled 4878 miles of trunk lines and 1530 of gathering lines. Since pipe lines are an important link in the domestic transportation situation during the war emergency, everything possible has been done to secure maximum throughputs. The crude oil trunk pipe lines, last year, transported almost 120 million barrels; products pipe lines carried nearly 29 million more barrels.

RESEARCH

Again last year, Shell Development Company devoted its entire efforts to the solution of problems connected with the nation's war effort. Knowledge acquired during research in the petroleum field enabled Shell to perfect the new method of extracting penicillin, discussed in the article on page 2 of this issue.

SHELL CHEMICAL DIVISION

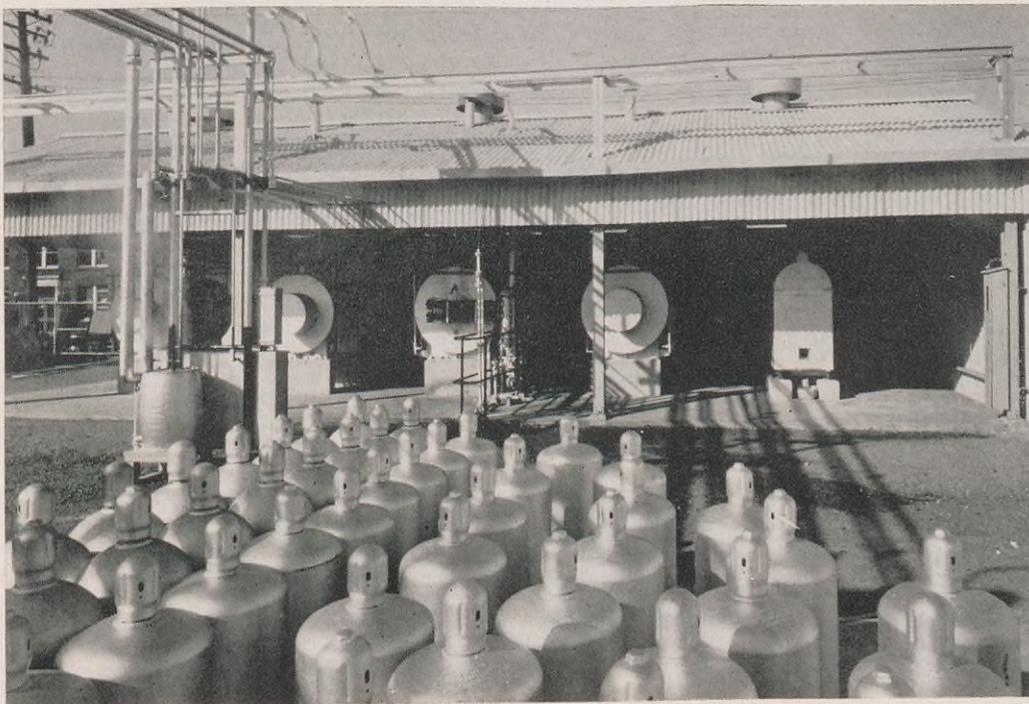
Wartime demands for the chemicals manufactured and marketed by the Division taxed its production facilities to the utmost with the result that the plant output of all products reached unprecedented levels. Shell Chemical Division's activities were further broadened by the construction of new facilities for the partial conversion of some of its primary products into other chemicals needed by the chemical industry in the production of war materials. Shell Chemical continued to operate the Government-owned butadiene plant at Los Angeles, and the Cactus Ordnance Works, where during the year production of an important aviation gasoline additive was undertaken on behalf of the Army. This year the plant has been converted to the manufacture of ammonia.

PERSONNEL

At the end of the year there was a total of 26,255 employees, including 4401 women, on the Company's payrolls. To these men and women a total of almost \$85 million was paid in salaries and wages. During the year employees put more than \$8 million into War Bonds under the payroll deduction plan.

The Provident Fund, made available on January 1st of last year to all regular employees with one or more years of service, had a membership of 21,612 employees . . . 96.7% of all eligible employees. The total contribution of the Company to the combined Provident Fund and Shell Pension trusts was \$8,738,000. Monthly pension checks are being mailed to more than 600 persons.

The number of employees in the armed forces reached 6620 during the year. All employees with at least one year of Service with the Company, who were on the payroll on December 31st, 1941 received a leave of absence with two months' pay upon entering the armed forces. The Company continued to pay a portion of the cost of their National Service Life Insurance: What is of more importance, however, to all married men or those who have dependent children, the Company made up the difference between their military pay and their former Company compensation up to half of their former pay with Shell. The total cost of the program for the year was over \$2 million. Eighty-five per cent of Shell's men in service known to have been honorably discharged and returned to civilian status have come back to work with the Company.

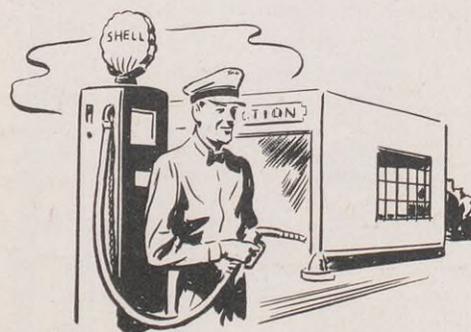


One of the major developments in the nation's war effort in which the oil industry has participated to a large degree is the synthetic rubber industry. Shell Chemical Division continued to operate the Government-owned butadiene plant at Los Angeles; Shell Development continued its experimental work with synthetics at the Torrance, California (left) plant.

SHELL UNION OIL CORPORATION AND

WHAT WE

From the sale
of products
\$489,202,000



WHICH GAVE US A
\$495,38

HOW WE USED EACH



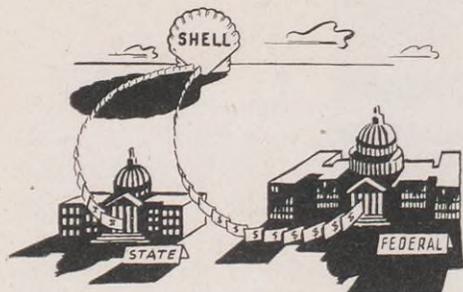
Paid to employees as wages,
salaries, military leave allow-
ances, and other benefits
\$90,690,000

18¢



Paid to many thousands of peo-
ple who have invested money in
the Company . . . as dividends
on their common stock
\$20,206,000

4¢



Paid taxes (including amount
set aside for Federal income
and excess profits taxes)
\$46,086,000

9¢



Paid as interest on borrowed
money, and other expenses
\$2,743,000

1/2¢

AND SUBSIDIARY COMPANIES' EARNINGS WAS RECEIVED

A TOTAL INCOME OF
\$3,382,000



From dividends and
other income
\$6,180,000

PER DOLLAR OF INCOME

12¢

Provided for wear and tear of all plants and equipment, exhaustion of oil reserves through production of oil and gas, expenses of drilling wells, losses on properties retired or abandoned, and other property provisions

\$57,431,000

34¢

Purchased crude petroleum and refined products

\$166,612,000

19¢

Paid for materials, services, rents, repairs and other expenses of producing, transporting and refining crude oil, and transporting and marketing Shell products

\$93,656,000

2¢

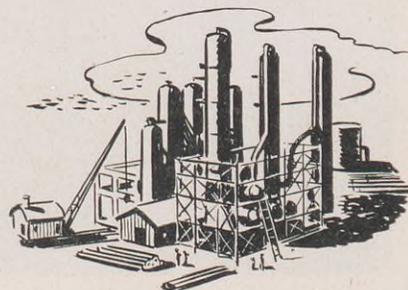
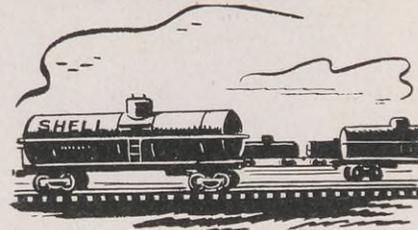
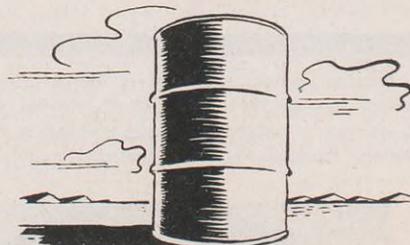
We made provisions for contingencies arising from the war and for conversions of operations to a peace-time basis

\$10,000,000

1½¢

The balance was retained as working capital

\$7,958,000



WITH THE COLORS



Pfc. Prentiss Daniels, Wood River Refinery, was killed in action in Germany late in 1944. Pfc. Daniels entered service in January of last year and received his basic training in the Infantry at Camp Blanding, Florida. He went overseas in July.



Private Arthur F. Stimpson, Boston Marketing Division, was killed in action in Germany during January. Private Stimpson entered the Army in April, 1944, and received his basic training at Camp Wheeler, Georgia.



Lt. Michael M. Buck, Minneapolis Marketing Division, has been reported missing in action in France. Lt. Buck received his training at Fort Benning, Georgia, and Camp Gruber, Oklahoma. He went overseas in November with the 42nd (Rainbow) Division.



Chief Shipfitter Floyd B. Stufflebeam, Wood River Refinery, has been decorated with an Appointment to the Order of the British Empire. He entered the United States Navy in July, 1942, and recently returned after twenty-one months overseas. His decoration was received for courageous and outstanding performance, over and above the call of duty.



S/Sgt. Herbert L. Hock, Shell Pipe Line Corp., previously reported missing in action, was shot down on his 39th mission in the European Theatre. He is now back in the States after playing a grim game of hide-and-seek for 4½ months with Germans, Bulgarians, and Albanians. In 16 months overseas Sgt. Hock was decorated with the Silver Star, Air Medal with six Oak Leaf Clusters, the Purple Heart, and a Distinguished Unit Citation given his entire group.

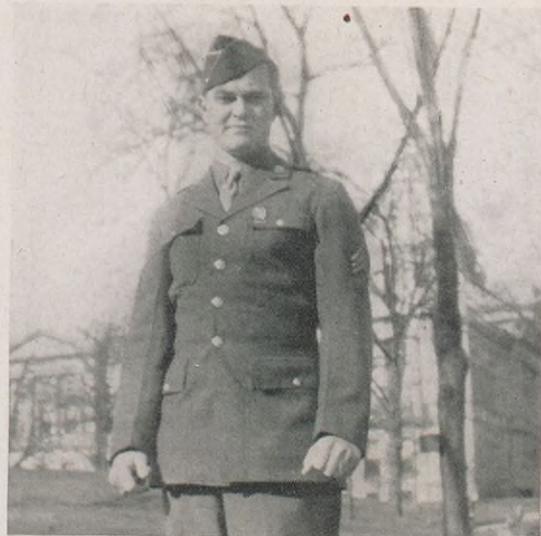
Sgt. Hock's plane crash-landed in mountainous territory but luckily none of his crew received severe injuries. Friendly natives contacted the Americans after the crash and the fliers were kept hidden in the mountains. Contacts were established with officers of the 15th Air Force in Italy and two planes were sent to the rescue. Sgt. Hock is now stationed at Lowry Field, Colorado, hoping for an assignment with a B-29 Super-Fortress crew.



Lt. J. H. Sembower, Head Office, Public Relations, was recently presented with the Bronze Star by Assistant Secretary of the Navy Hensel. The award was made for Lt. Sembower's contribution toward the destruction of over 100 Japanese barges. He was on the staff of the Commander of a 7th Fleet Motor Torpedo Squadron operating against enemy forces in the New Guinea area. Lt. Sembower conducted 50 PT combat patrols against hostile barge traffic around the Cape Huon Peninsula. The Navy citation stated, "He conducted the patrols with determined aggressiveness despite terrific fire from enemy surface craft, aircraft, and shore batteries. Lt. Sembower employed a comprehensive knowledge of the dangerous waters and of Jap gun positions and tactics. He rendered invaluable assistance to inexperienced boat captains during a period of intensive operations."



William A. Scott, SK 2/c, Shell Pipe Line Corporation, has returned on a 30-day leave after two years in the Pacific. Scott has taken part in two major naval operations and on his Asiatic-Pacific Campaign ribbon wears two bronze stars for activities during the New Georgia and Bougainville campaigns.



Lt. Joseph L. Sanders, Texas-Gulf Area, recently received his commission on the battlefields of France. The recommendation for his appointment said, in part, "Under extremely adverse conditions, Sgt. Sanders proved his ability to think clearly and constructively, and, further to execute the plan he had formulated. His excellent leadership, cool judgment, and perseverance in surmounting numerous hazards reflect credit both to himself and to the military service."



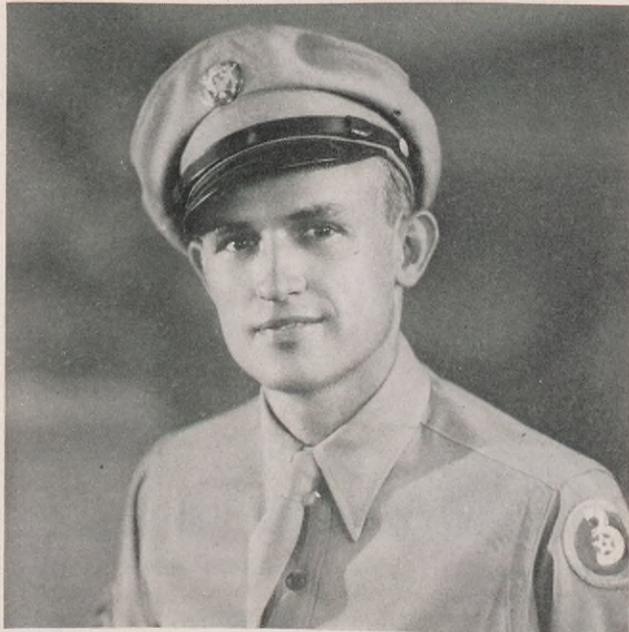
Albert E. Gdula, Albany Marketing Division, was promoted from first lieutenant to captain and received the Distinguished Flying Cross on the same day. Captain Gdula won his DFC for extraordinary achievements while flying high altitude precision bombing attacks against targets in Germany. He has completed 30 combat missions and since his 14th has been a lead navigator. In this capacity it has been his responsibility to lead a number of heavy bombers to their targets.



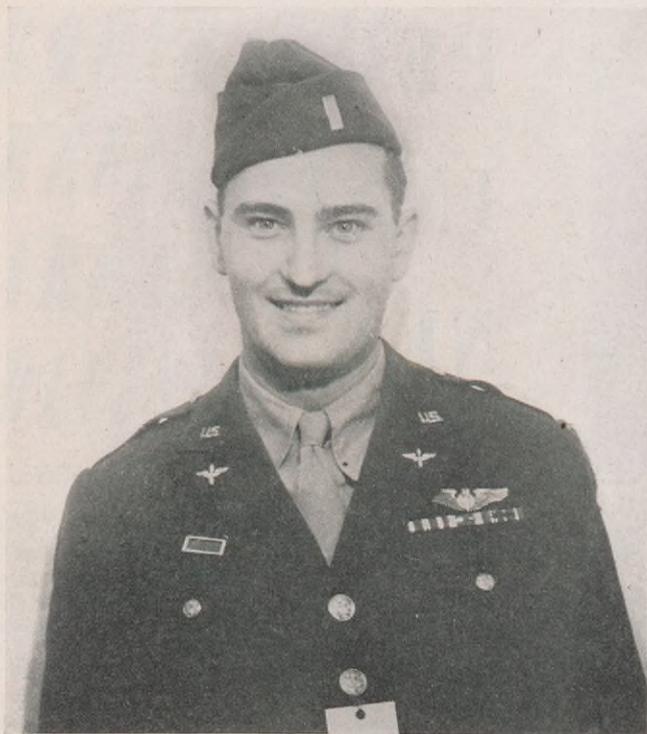
Lt. Col. John S. Hoppeck (right), New York Marketing Division, has received the Distinguished Flying Cross. On December 9th he went on a mission scheduled for Vienna. His takeoff was delayed by last-minute mechanical difficulties. When Colonel Hoppeck was able to get off the ground he could not find his group in the murky weather; he did manage to pick up information on his radio that they were going to their alternate target. Colonel Hoppeck beat the formation to it, found no friendly planes near, and made the bomb run. In the face of enemy fire and with no fighter support he dropped the bombs, then went back alone.



Lt. Bennett G. Lamb, Texas-Gulf Area, is stationed in Belgium with a Thunderbolt squadron. Lt. Lamb holds the Distinguished Flying Cross, and the Air Medal with fourteen Oak Leaf Clusters.



S/Sgt. George E. Crist, Texas-Gulf Area, was awarded the Air Medal for "meritorious achievement in aerial flight in missions totaling more than one hundred hours over enemy territory of Northern Burma."



Lt. Charles B. Robinson, Houston Refinery, has returned to the States after completing 70 combat missions over France and Italy. He was awarded the Distinguished Flying Cross for "extraordinary achievement while participating in aerial flight." Lt. Robinson also wears the Air Medal with five Oak Leaf Clusters.



Sgt. James Blaine, Mid-Continent Area, has been overseas for more than two years. He is with the 42nd Bomb Group of the 13th Air Force and has been stationed on Guadalcanal, the Russell and Treasury Islands, and New Guinea.



Chief Storekeeper R. D. Perry, Sr., Houston Refinery, was home on leave at the same time as his son, Lt. R. D. Perry, Jr. The two visited the refinery together. Perry, Sr., is a veteran of the first World War.



P. E. LAKIN



DR. E. F. DAVIS



ALBERT R. CULBERTSON

PEOPLE IN THE NEWS

P. E. LAKIN, Vice President, Marketing, has been elected a director of Shell Oil Company, Inc. Mr. Lakin came with the Company as a clerk in the Seattle, Washington, Office in 1915 and remained there until the war in 1917. He then served overseas with the Air Corps for two years. Upon his return to Shell he was assigned to territorial sales work. He has been successively cashier, chief clerk, and salesman in the Seattle Division office, later district manager, assistant division manager, president of a subsidiary company, general sales manager, and finally vice president in charge of Marketing.

• • •

DR. E. F. DAVIS, Vice President and Chief Consulting Geologist, Los Angeles, was also elected a Company director. Dr. Davis came with Shell in 1919 and engaged in geological exploration work for the Company. He became a Vice President and Chief Geologist in 1929 and ten years later was appointed Vice President, Los Angeles District. In 1944 Dr. Davis became Chief Consulting Geologist for the Shell Union Group of Companies.

• • •

ALBERT R. CULBERTSON has returned to the Company as Manager of the Products Application Department. He had been on a special leave of absence to accept an appointment as Asst. Director of the Refining Division of the Petroleum Administration for War. Mr. Culbertson came with the Company in 1923 as an assistant chemist at the Arkansas City, Kansas, refinery. In 1925 he was transferred to Norco Refinery as Chief Chemist and three years later became Head Stillman. In 1930 he was named Chief Technologist for Norco Refinery. He received his present appointment in 1940.

ROUND THE REFINERIES, AREAS, AND DIVISIONS



One Shell employee who is not the least bit affected by the cigarette shortage is Woodrow G. Barrow, loader-clerk at the Greensboro Terminal of Products Pipe Line. As a hobby Barrow uses his eleven-acre-farm to grow tobacco. This farm, in the Oak Ridge section of Guilford County, is referred to as part of the best tobacco land in the country.

This season, the most demanding in North Carolina's history, these eleven acres yielded 13,750 pounds of tobacco. This crop began with seed from less than a dozen plants of the year before. They were planted in slip beds at the end of last season for use this year. Each spring Barrow and his helpers make the land ready: plowing, refinishing, applying fertilizer, and transplanting the slips. The following 90 days are spent in cultivating each acre four or five times. Then the leaves must be topped (removing buds from the tops of the plants) to regulate the height and help develop fullness. The bottom leaves ripen about 90 days later and are ready for curing, the others shortly thereafter.

The leaves are exposed to heat of approximately 100 degrees F. for 36 to 48 hours until they become a yellowish color; then the temperature is increased to 185° F. for another 30 to 36 hours, and the leaves become dry and brown. After cooling, the leaves are placed in the basement, where they remain until they attain a flexible condition which enables them to be handled without crumbling.



The leaves are graded into their 30 or 40 color assortments, tied into bunches, and hauled to a nearby market where they go on sale.



The city of Columbia, South Carolina, held an industrial exhibit for the men stationed at nearby Fort Jackson, and others in the armed forces who were in the vicinity. The exhibit was held during the last week in February and was attended by thousands of soldiers and marines. Various companies sponsored booths which showed what was being done in their industry during the war, and what was planned in the post-war period. Shell's booth created considerable interest. The display consisted of a diagrammatic representation of a refinery, and samples of motor and turbine oils and various greases. The servicemen asked many questions pertaining to the Company's products. The Hon. Ransome J. Williams, Governor of South Carolina (pointing to a picture) was particularly interested in Shell's exhibit. He is pictured with military personnel from Fort Jackson and Jay Trexler, Baltimore Marketing Division, second from the left.



Inspecting a mud pump on a drilling rig are Ruth Henegar, Eunice Green, Faye Thomas, Clara Turner, Betty Mestayer, G. F. Moore and Jimmy Whatley.

Nine members of the Accounting Department at Houston in the Texas-Gulf Area spent a day in the field recently. Those who took the trip are all students in a night course in production cost accounting at the University of Texas. The trip was planned to give employees taking the course a better understanding of the application of accounting theory to actual field operations. Familiarizing employees in related operations with equipment being used in drilling and production operations, and the various methods of handling oil before it is turned into the pipe line is part of the training program in the area.



Moore and Bert Bienvenu listen to Production Foreman Dee Wait's explanation of his recordings in checking meter readings.



Betty, Clara and Ruth get a good look at a Christmas tree on the warehouse tool platform.

AFTER HOURS

Wood River Refinery's basketball team, which represented the Shell Athletic Club in the Alton City Basketball League during the past season, won the championship for the first half of the season's play. In the playoffs for the league title the team lost. The players are (top row), M. A. Sullivan, J. C. Carlton and R. D. Pinkerton; middle row, G. E. Naugle, O. D. Phelps; front row, J. J. Cleary, K. E. Rohr, and J. A. Petrasky.



The Wood River Refinery women not only have their basketball team, too . . . they outshine the males. The first girl's team at the refinery won the championship in their Industrial Basketball League. Standing are E. T. Maguire, Assistant Coach; Mary Newman, Betty Schaefer, Edith Leonard, Al Bott, Manager and Coach. In the second row are Margaret Armes, Aleene Rayburn, Jean Kirk, Alyne Brave; while in the front row are Eileen Gallatin, Viola Simpson, Harriet Lange, and Margaret Davis.

Three Texas-Gulf Area men went a-hunting and came back with three deer. Dennis Kemball-Cook (left) shot two, and Gordon White accounted for the other. It isn't difficult to decide which one failed to account for any. Gordon Metz, on the right, looks a bit chagrined at coming back empty-handed. Hanging second from the right is a hog.





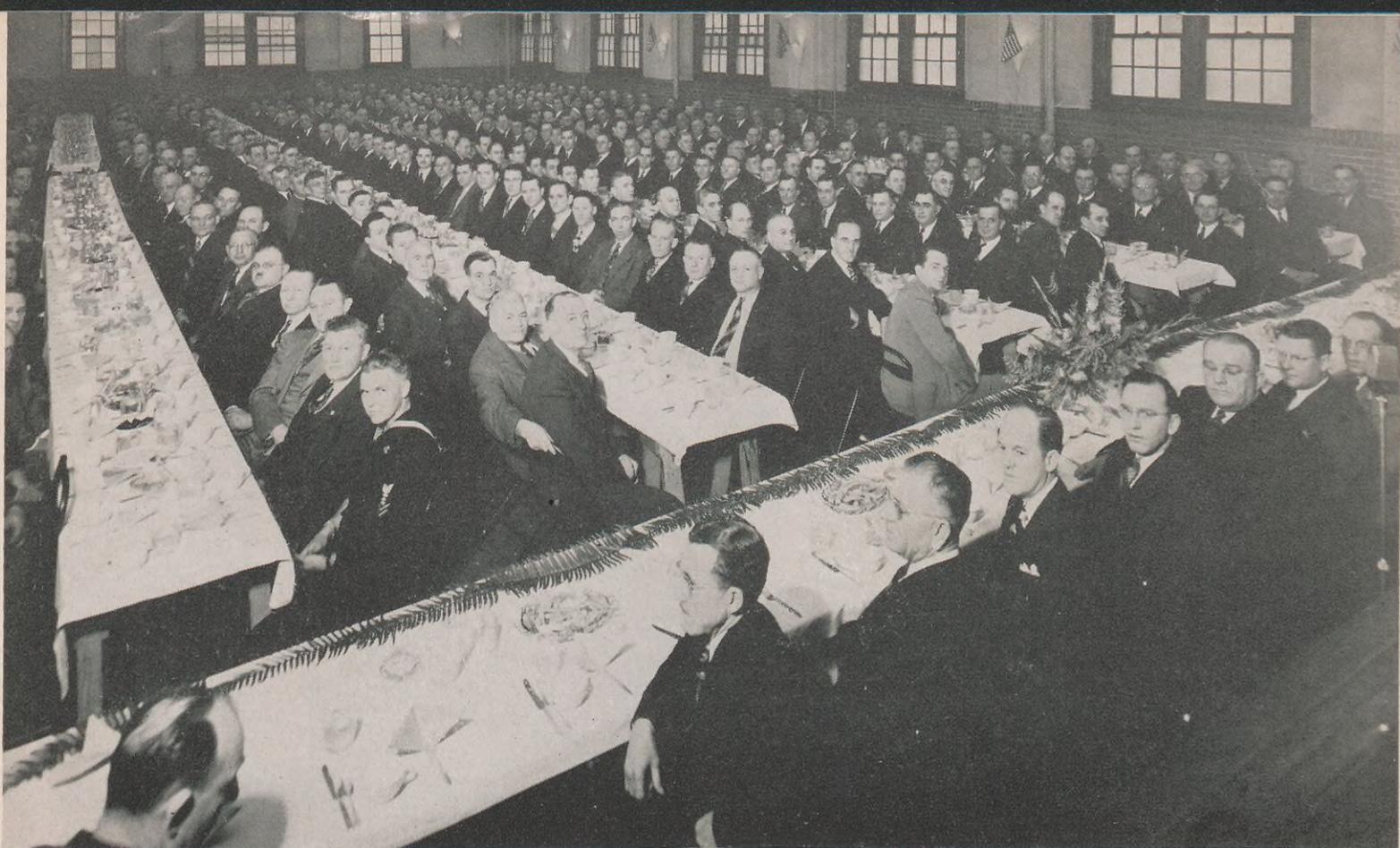
The Houston Refinery basketball team finished second in both of the leagues in which it competed. J. D. Thompson, Coach, is in the rear; in the back row are J. C. Boudreaux, C. A. Janac, J. R. Lacy, E. E. Morris, G. L. Martin, C. G. Scott, and Tom Osburn; in the front row are J. T. Cutrer, J. T. Arterbury, D. R. Julian, E. H. Crawford, and D. W. Stewart.



Dorothea Piatt, Mid-Continent Area, receives a \$100 War Bond for picking the all-time All-Star Tulsa University football team. The contest was sponsored by a Tulsa bowling alley.



During the coal emergency in late winter the New York State Guard was called to active duty to assist in handling the fuel. Lt. William Wentworth (light coat), District Supervisor for the Albany Marketing Division, was commander of an emergency trucking unit.



The two annual banquets of the Wood River Refinery Shell Service Club were held during the middle of February. Four hundred members attended the first and three hundred and fifty attended the second. The Club now has an active membership of 1384 employees, all with more than ten years' service. Above are those who attended the second session, while below are those who were at the first.





Service Station dealers throughout the country who have been selling Shell's products for many years have been presented with special service award plaques. The plaques indicate the number of years these men have been Shell dealers. New Orleans was the scene of the first presentation when Atlanta Marketing Division representatives presented their oldest-in-length-of-service dealers with the plaques.



Clem Socie of the Lima, Ohio, Products Pipe Line Terminal, together with a brother, makes ice-boating his hobby. The Socie brothers have won eight championships in competition in the Toledo-Detroit area. Their boats reach a maximum speed of a hundred miles an hour.



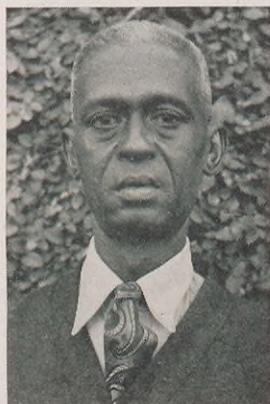
League leader in the Houston Refinery "C" Bowling League, one of the three at the refinery, is the Chemical Division team. The members of the team are Gene Davenport, E. R. Adlof, Floyd Reitz, and Paul Murrell.

SERVICE BIRTHDAYS

... TWENTY-FIVE YEARS ...



H. BLOEMGARTEN
Vice President
Head Office



J. COTTON
Engineering
Norco Refinery



H. E. HARVICK
Engineering
Wood River Refinery



H. HOCKINGHOMER
Engineering
Wood River Refinery



E. J. LORIO
Engineering
Norco Refinery



J. L. MILLER
Administrative (mil. leave)
Houston Refinery



A. P. REUTHER
T & S
Head Office



J. M. TROXLER
Engineering
Norco Refinery



O. J. TROXLER
Engineering
Norco Refinery

T W E N T Y Y E A R S



W. B. ANDREWS
Crude Oil
Mid-Continent Area

C. W. ARNOLD
Operations
Chic. Mktg. Div.



C. S. BLANKENSHIP
Engineering
Wood River Refinery



J. C. BLOEMEKE
Lube
Wood River Refinery



O. F. BREGGER
Lube
Wood River Refinery



K. D. MCFARLAND
Lube
Wood River Refinery



J. MORAN
Engineering
Wood River Refinery



C. W. MYERS
Storehouse
Wood River Refinery



J. J. PHILLIPS
Dispatching
Wood River Refinery



J. G. ROBINSON
Cracking
Wood River Refinery



W. BOURGEOIS
Engineering
Norco Refinery



A. A. GATES
Production
Texas-Gulf Area



M. R. CHURCH
Gas-Gasoline
Texas-Gulf Area



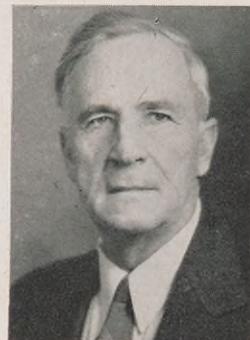
O. R. COX
Engineering
Wood River Refinery



C. R. DAVIS
Marketing
Head Office



M. G. DANIEL
Purchasing-Stores
Head Office



L. A. DODSON
Lube
Wood River Refinery



G. HOLFORD
Engineering
Wood River Refinery



C. A. JORDAN
Administrative
Cleve. Mktg. Div.



F. M. JONES
Production
Mid-Continent Area



J. A. LABARGE
Production
Mid-Continent Area



O. C. LACKEY
Production
Mid-Continent Area



C. O. LASHLEY
Lube
Wood River Refinery



W. T. LEWIS
Engineering
Wood River Refinery



R. L. LUCAS
Main Office
Houston Refinery



B. L. TANNER
Lube
Wood River Refinery



A. R. TAYLOR
Lube
Wood River Refinery



G. H. THOMPSON
Production
Mid-Continent Area



J. B. THOMPSON
Shell Pipe Line Corp.
Head Office



T. C. VIETH
Operations
St. Louis Mktg. Div.



J. F. WEBBER
Engineering
Wood River Refinery



B. L. WOLVERTON
Engineering
Wood River Refinery



P. R. WHITE
Production
Mid-Continent Area



H. V. WOLFE
Dispatching
Wood River Refinery

HEAD OFFICE

15 years

MISS H. C. BOGSTAHL	PRESIDENT'S OFFICE
MISS H. H. CHAMBERLAIN	SHELL UNION
MISS C. F. HOLTEN	TREASURY
L. A. LOHMAN	INDUSTRIAL RELATIONS
MISS I. McCORMACK	LEGAL
T. T. McCLELLAN	MANUFACTURING

10 years

E. M. SOELLER T & S

SHELL PIPE LINE CORP.

15 years

B. F. DAILY	BAYOU PIPE LINE
D. F. COLEDGE	WEST TEXAS AREA
C. W. KLUGE	MID-CONTINENT AREA
J. E. McNEIL	BAYOU PIPE LINE
C. S. RAMSEY	TEXAS-GULF AREA
L. TERHUNE	MID-CONTINENT AREA

10 years

J. A. GUNN	(mil. leave) WEST TEXAS AREA
R. P. HARVEY	WEST TEXAS AREA
R. B. HEXT	TEXAS-GULF AREA
J. R. TYLER	(mil. leave) TEXAS-GULF AREA
H. E. WHITE	BAYOU PIPE LINE
R. J. CLONTZ	WEST TEXAS AREA

SHELL AMERICAN PETROLEUM COMPANY

15 years

E. C. HANCOCK KOKOMO, INDIANA

PRODUCTS PIPE LINE

15 years

C. E. AUSTIN TERMINAL

10 years

E. E. MARSHALL TERMINAL

TEXAS-GULF AREA

15 years

E. A. AVANT PRODUCTION

10 years

J. B. FAULK	PRODUCTION
W. S. FRUGE	PRODUCTION
P. GAUTHREAU	PRODUCTION
F. K. KAZETSKY	EXPLORATION
E. H. McCORKLE	(mil. leave) PRODUCTION
J. A. MOORE	(mil. leave) LAND
J. H. WRITTEN	EXPLORATION

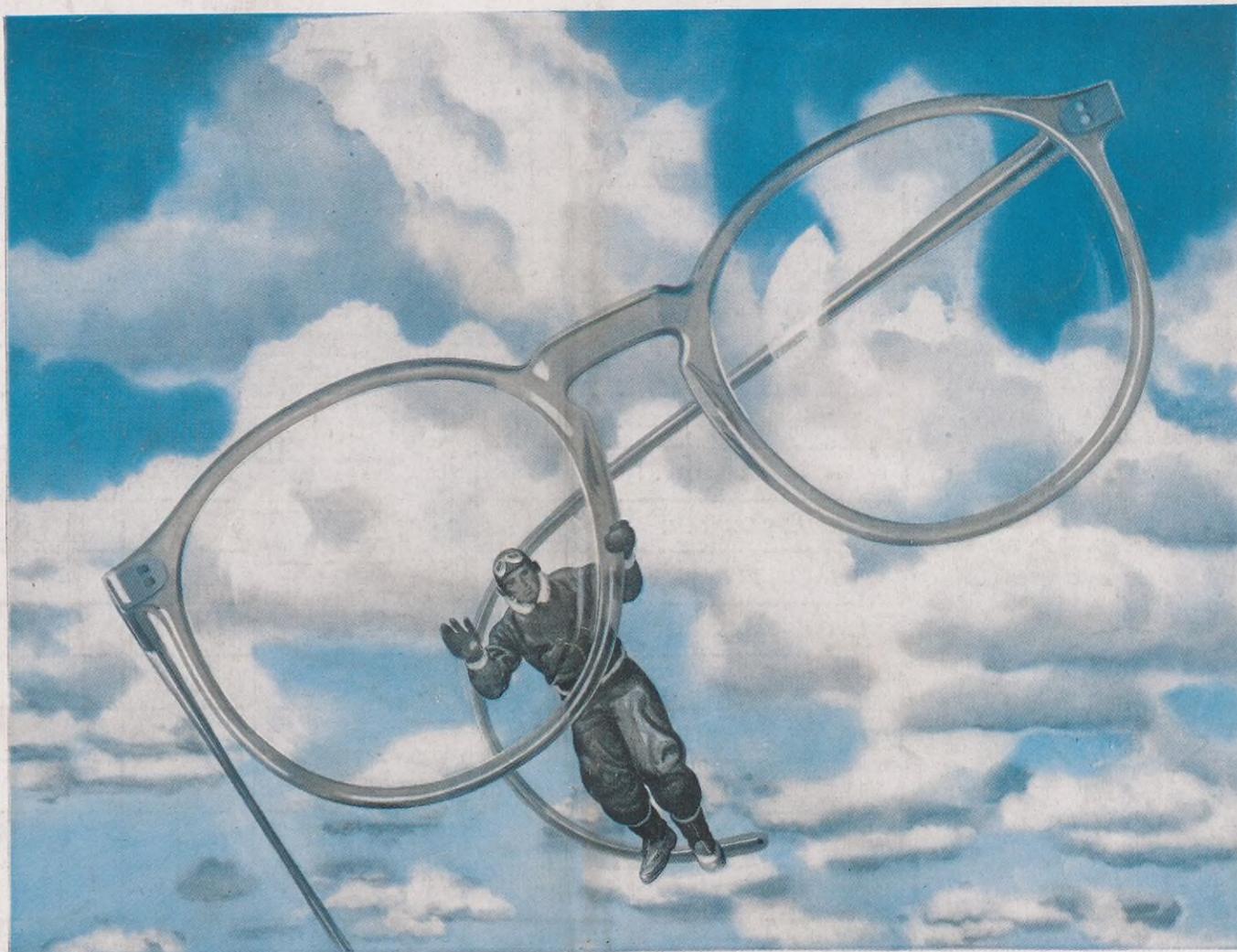
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INCORPORATED
50 West 50th Street
NEW YORK, N. Y.

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2820 Glasgow St.
St. Louis, Mo.

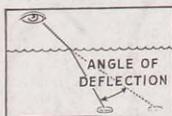
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U. S. POSTAGE
PAID
New York, N. Y.
Permit No. 1101

A SHELL ADVERTISEMENT CURRENTLY APPEARING IN SEVERAL NATIONAL MAGAZINES



SWEDLOW AEROPLASTIC CORPORATION, big name in plastic-forming, makes plane noses, turrets, hatches that give our pilots unimpaired vision! Swedlow's revolutionary forming process employs an outstanding Shell Industrial Lubricant.

"SPECS" FOR 20-20 EYES



Simplest illustration of light-bending is the distorted view you get of an underwater object. To offset similar light-bending in plastics is a complex problem.

essential "spectacles" which must maintain optical accuracy of the other lenses—not distort it. This calls for *telescopic* standards of perfection—a radian tolerance of .004 or deflection from line of sight of no more than 4 yards at a distance of 1000 yards!

To these sharp plastic contours a new process—developed by techni-

Where vision is vital! In the air all optical equipment, gun ring to bombsight, is *telescopic*. Methyl methacrylate crystal-clear plastic bomber noses and turrets, and cockpit hoods for fighters, are essen-

cians of Swedlow Aeroplastic Corporation—gives unusual freedom from distortion, bubbles, resultant optical flaws. The mold—covered with felt—is smeared with a very heavy lubricant. On top, a sheet of heated plastic is placed—then drawn over the mold like metal.

But a lubricant of unique qualities is required. It must be heat-resistant... able to melt and run ahead of the contact without sticking... yet must leave no soap particles or bubbles.

After many ordinary greases had proved unsatisfactory, Shell Lubrication Engineers were called in... went to Shell's research laboratories with the problem. Scientific research brought forth a special Shell Lubricant...

Tested in the Laboratory: it showed the required quality—and better! On the actual job: today this special Shell Lubricant is working so well that Swedlow rejections are at an *all-time industry low*.

Yesterday's solution is seldom good enough to meet today's vital lubrication problems. At Shell's research laboratories, lubricants are constantly being improved. Shell Lubrication Engineers apply these improvements in the field.

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