
On Tour

ON TOUR

VOL. 10, No. 7
JULY 1948

In This Issue

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ON TOUR is published monthly in the interests of employees of Union Oil Company of California. Employee contributions of pictures, news reports and suggestions are invited. Address communications to the Editor, 617 West 7th Street, Los Angeles 14, California.

THE GRAPEVINE

In most branches of industry and society there exists a remarkable form of communication. It needs no wires, mechanical instruments or skilled operators. It costs nothing to install, requires no upkeep, presents no invoices. Although one of the oldest inventions of man, it came by its modern name during the American Civil War. Of course you know by now that we refer to that wireless broadcasting system known in America as the grapevine.

Oddly enough, this editorial has no quarrel to pick with any means of distributing information. Even the grapevine is accurate occasionally, informative oftentimes and exciting always. And it is particularly immune to scathing editorials. But we should like to give it some tough competition by announcing that ON TOUR is prepared to offer a higher type of service at an equally popular price.

Union Oil Company management is deeply and actively concerned about keeping employees, dealers, shareholders and the public accurately informed. It is felt that the cause of much unrest agitation and turmoil today is due to lack of human understanding. Danger lurks particularly in complex societies where our failure to observe and evaluate the problems of other people leads to quarreling, intolerance, hatred and all other varieties of strife. Danger lurks, too, in complex industries where it cannot be said of any one man that he knows everybody and everything connected with the business. It is earnestly desired by our management to "let the employee in on what's going on."

ON TOUR is proud this month to take a progressive step in industrial journalism. We call our readers' attention particularly to "Does This Answer Your Question?" and "Our Industrial Summary," appearing for the first time in this issue. The former grew out of many questions asked by employees during the motion picture showing of "Report for '47." The latter, a digest of departmental activities throughout the Company, is designed to give every employee the most comprehensive and accurate insight of Union Oil operations.

What would you like to know that hasn't been told? ON TOUR will attempt to match every grapevine rumor with official facts. Address the editor.

THE COVER

This spectacular explosion off the Santa Barbara coast was designed not to destroy but to serve humanity. For our description of seismic exploration under the sea, turn to Page 8 of this issue.

Supplying the Chaco

The travel diary of Charles S. Perkins, Assistant Manager of Purchases, hints of several obstacles Union Oil faces in keeping supplies flowing along a 12,500-mile supply line to our exploration activities in Paraguay.

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February 1, 1948—Boarded a Pan American Air Lines plane in Los Angeles at 10:45 last night, arriving in Mexico City at 9 o'clock this morning. Enjoyed a Sunday tour of the city with Charles Schneider, who recently retired from Associated employment in San Francisco, and with his son-in-law who is Minister of Hydraulics in the Mexican Cabinet.

February 2—Today's flight from Mexico City to San Jose, Costa Rica, with stops at Tapachula, Guatemala, San Salvador and Monagua, was a rough one. On arriving at the Costa Rica airport, found S. J. Meares and Harry Dykes there to meet me. We drove to the recently completed marketing station, which I found to be surprisingly modern.

February 3—Steve Meares today drove me down to the new marine terminal at Puntarenas. I was very favorably impressed with the location of the station, as well as its construction. The normal collection of excess material usually found just after construction is completed was noticeably lacking here. The plant is very well situated on a peninsula, with an estuary on one side for servicing small craft and a bay on the other side where larger vessels may refuel or discharge cargo. The first shipment of Union products to the station is being delayed because of political unrest. Elections are only a few days away and the political situation seemed to be very tense. We were stopped four times by the military, and our car was searched for concealed weapons. Costa Rica's chief products are coffee and bananas, with sugar cane, pineapples, cotton and cattle adding to the country's income. Practically all hauling is done with ox carts, as roads have not been developed for motor truck use. The country is beautiful, the climate ideal.

February 5—Met Harry Painter, Division Manager, last evening at Balboa after my afternoon flight from Costa Rica. We visited our plant and took an evening drive through interesting Panama City. Today Mr. Painter drove me across the peninsula to Colon and return—a transcontinental round trip in just a few hours. With Bob Worsley, our District Manager, examined stocks in Government warehouses of the Canal Zone, some of which stocks are available to the Company for use in our Balboa operations. Also looked at some excess construction units purchased from the Government and available for export to South America; however, asking prices are considerably above those in the States.

To serve the needs of this Union wildcat at La Paz, Paraguay, materials travel one of the longest supply lines in the world.

February 7—Arrived at Buenos Aires about 7 o'clock tonight. Trip from Balboa, commencing afternoon of the 5th at 2:30, was delayed four hours by failure of a plane motor. Stops enroute were made at Guayaquil, Ecuador, Lima, Antofagasta and Santiago. Had a nice chat with Mr. Navarette, our Santiago representative, while the plane was refueling there.

Gordon Livingston, from our Asuncion Office, was on hand to greet me at Buenos Aires. At the hotel we joined Jack Lewis of Drilling and Exploration Company to discuss our Buenos Aires transshipment problems. The docks at this point are very congested. After our supplies are unloaded from sea-going vessels, it is almost impossible to have them extricated from other materials and headed on up the river by small boat or barge. Unquestionably most of this congestion was caused by the recent civil war in Paraguay. Conditions, so I am informed, are not as bad as they were a few months ago; however, there is much room for improvement. It may be possible for us, in conjunction with Drilling and Exploration Company, to speed up transshipment by employing some Argentinian who is familiar with dock operations.

From these docks at Asuncion, Company materials and supplies proceed up the broad Paraguayan River to Puerto Casado, whence they are transshipped to our Chaco headquarters by rail. The river is navigable for fairly large boats up into Brazil.

February 8—Arrived at Asuncion at noon after a five-hour flight from Buenos Aires and was met by Chester Cassel (Manager of Paraguay Operations), Newell Williams, Fritz Skinner and Stan Martin. As these men knew the customs and the customs officers, the clearing of my luggage was a breeze. After a stop at Mr. Cassel's home, I was taken on to the hotel where my attempt to catch up on some needed sleep was nullified by the extreme heat. At Mr. Cassel's Sunday evening dinner party I met all personnel of our Asuncion Office for the first time.

February 11—After a short visit to our Asuncion Office Monday, Stan Martin and I boarded the river boat "Iris" and arrived here at Puerto Casado this morning, Wednesday. The Paraguayan River is quite large and reminds one somewhat of the Mississippi. It is navigable for fairly large boats clear up into Brazil. Service on the boat was exceptionally good; staterooms were very clean; but I can hardly recommend an inspection of the kitchen facilities.

Mr. McClaine, general manager of Carlos Casado's quebracho industry (the extraction of tannin and medicinal compounds from quebracho trees), was very hospitable and took us on a tour of Puerto Casado facilities. Their fairly well equipped machine shop, wood working shop, auto repair shop and commissary are available for our use on a limited scale.

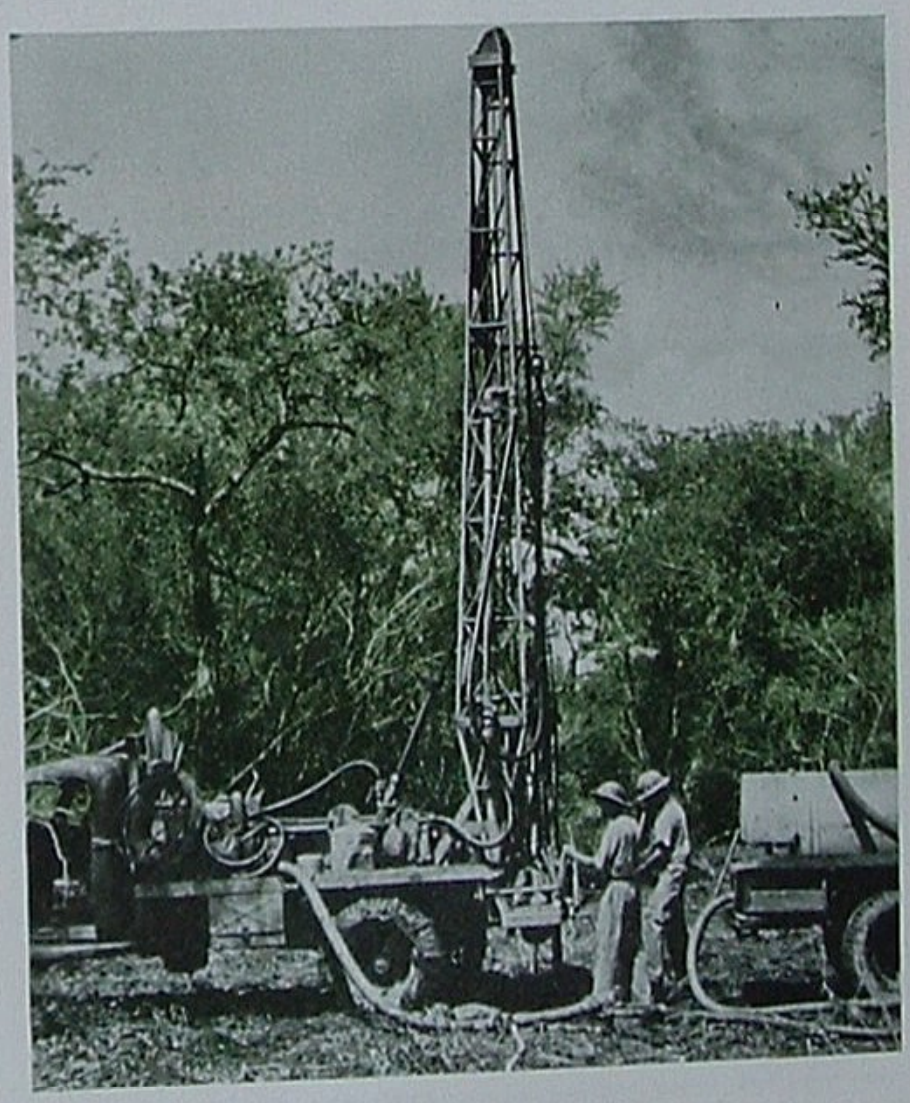
During the evening we traveled via autovia, which is a Model A Ford with railway wheels, over the narrow gauge railroad to Kilometer 83 in about two and one-half hours.

February 12 to March 16—Kilometer 83 is the location of Western Geophysical Company's Party No. 2. This location was made by clearing an area in the jungles and setting up several tents for housing. Their geophysical crew consists of approximately 50 men. Although it rained almost every day, the air remained hot and humid. Mosquitoes and poverines (a miniature mosquito with a vulture's appetite) made life miserable for everyone in camp. Tents and beds were very comfortable; the food was exceptionally good.

I spent part of one day in the field with a geophysical crew, and it is a most rugged life. As all work is carried on in the jungles, the tractors must go through first to clear a road of about cow-trail quality. The drill trucks follow and punch sixty-foot shot holes at intervals of 300 meters. Then comes the shooter's truck to plant dynamite charges in the shot holes, followed by the recording truck. After laying their lines, the crew discharges each shot and records its reflections. The operation is more difficult at this time of year during the rainy season, as almost all equipment has to be dragged by caterpillar tractors.

"As all work is carried on in the jungle, the tractors must go through first to clear a road of about cow-trail quality."

"The drill truck follows to punch 60-foot shot holes, after which dynamite charges are planted and reflections are recorded."



Among Union Oilers living in Asuncion are (L-R) Gene Loper, Mrs. Stan Martin, Fritz Skinner, Mrs. Skinner and "Jr." Skinner.

Stan Martin poses with the Autovia, a Ford with railway wheels, which travels the narrow gauge railroad to Kilometer 83.

Tents and mosquito netting are the answers to housing problems of men who are today seeking oil in Paraguayan jungles.

The jungle is very dense and thorny; bugs are worse than at camp. However, the morale of the boys is very high and lots of work is accomplished even under extremely adverse conditions. On this particular crew there are only two Americans, the rest being Paraguayans who are doing a very satisfactory job.

It was necessary to spend two extra days at Kilometer 83, as the rains halted transportation over the military road to Mariscal Estigarribia. However, on Sunday the Military permitted us to travel the road to our headquarters in the Chaco, where we arrived that evening.

Our headquarters just outside the fort at Mariscal Estigarribia consist of an obrero camp, housing approximately 100 native laborers; an engineers' and empleados' camp, for about 20 Paraguayan employees; and quarters for the American personnel; also an auto repair shop, a welding shop and a very large warehouse. The main warehouse with its 9,000 square feet of floor space accommodates all automotive parts, drilling rig parts, camp supplies, etc. It is a frame structure with split palm logs for siding and a roof made of second-hand corrugated asphalt paper. This extremely poor roof seems to admit three inches of rain whenever two inches fall outside. The condition will be corrected as soon as shipments of corrugated iron and aluminum are received in Paraguay. A food deposito located near the kitchen is too small to hold all food stuffs shipped from the States, so new food storage is being added to the main warehouse. Still another building houses the necessary supply of oils, greases, gasoline, diesel fuel and some 250 tires.

Our Chaco warehouses at present contain some 15,000 items of stock, ranging from the smallest tractor part to the largest replacement item for a drilling rig, and having a valuation of approximately $800,000. Gene Loper, an American in charge of the warehouse, has done an exceptionally good job of selecting and training his Paraguayan crew of warehousemen.

Several tons of boxed materials arrived from the States during my stay. Their condition on arrival was extremely disappointing and demanded that many changes be made in our packing methods at various shipping points.

From a radio shack attached to the warehouse, contact is made each morning starting at 7 o'clock and each evening starting at 4:30 with the three geophysical camps, the drilling well at La Paz and also Asuncion. Requisitions for materials are taken over the radio and orders are shipped to the groups as transportation is made available.

On the arrival by plane of Mr. Cassel from Asuncion, we went out to the drilling well, which is about 55 kilometers west of the main camp. Here we discussed service and equipment problems with the mechanics and drillers and conferred with Dr. Gomez regarding supplies for our completely equipped emergency hospital maintained at the drilling site. The doctor is very capable and contributes much to morale in the Chaco.

The following day we—Chet Cassel, Gene Loper, Art Woodbridge who is a driller for Western Geophysical, John Stollard, the Paraguayan tractor foreman, and myself—traveled in a 4-wheel drive Dodge to Party No. 3, located at Pequiba near the Bolivian line and 212 kilometers northwest of our main camp. This rugged trip over almost impassable roads took us through dense jungles infested with mosquitoes and myriads of nameless bugs. Several times it was necessary to haul out a winch line and pull the truck out of mud holes. We observed many Indians and wild animals on the way.

We were a tired group on arriving at Party No. 3 after 16 hours of travel and on a diet of only one sandwich each. After a few hours of rest, we discussed supply problems with the Party Chief's group and found their problems not too numerous. All camps are equipped with good tents and an adequate food supply, although Party No. 3, being new in the area, had not yet located cattle for their fresh meat requirements.

Incidentally, the location of this camp is on an old battlefield of the Chaco War where many Bolivians are said to have perished from thirst. Our men have drilled to a depth of 190 feet and developed one of our best fresh water wells. Spent ammunition, machine-gun parts and old bombs are scattered over an area. An old air strip, used by the Bolivians, was located and cleared so that our DC-3 can land with supplies and personnel.

Pequiba marked the turn-around point in my supply mission to the Chaco. As it was necessary for our Company plane to make an emergency trip to Brazil for a drilling line, we were obliged to return via the same routes and vehicles that had brought us in.

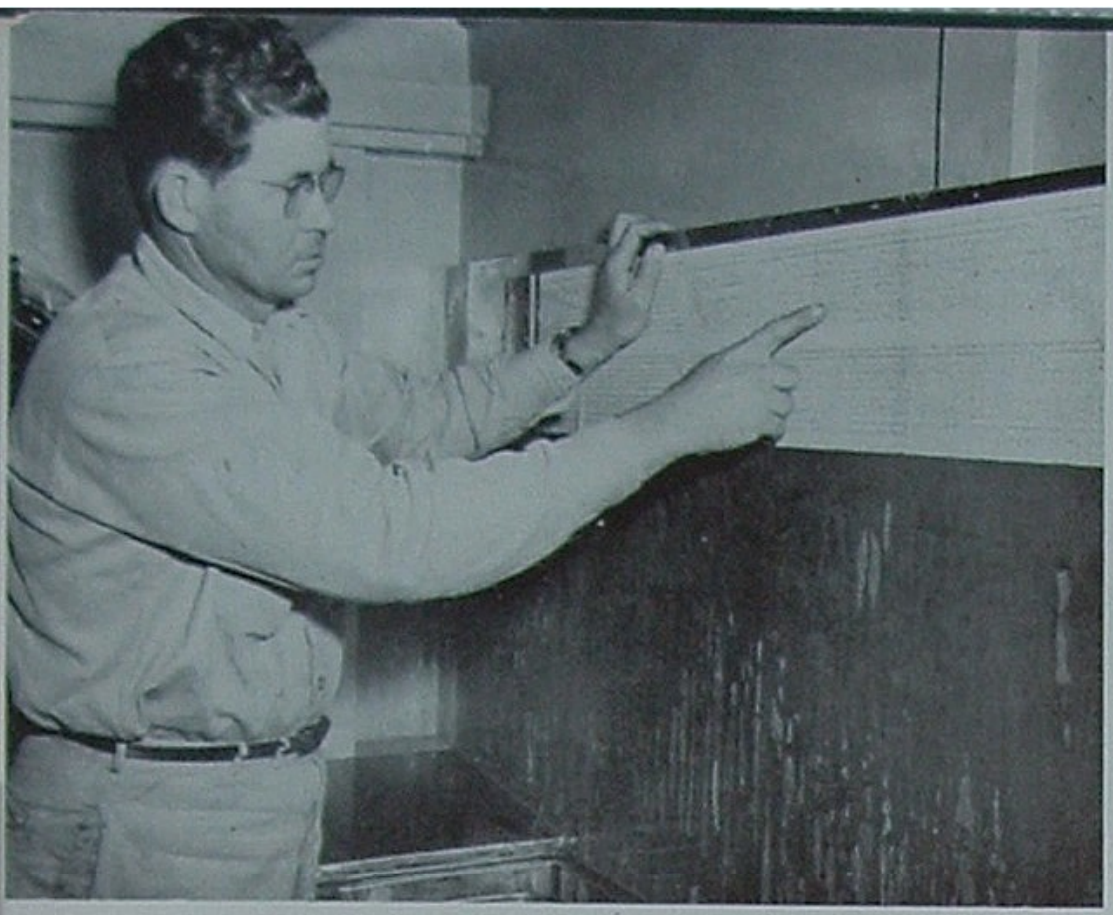
Back in Asuncion Chet Cassel called meetings of all supervisory employees at which many changes and improvements were made in regard to requisitioning, purchasing, shipping and accounting. I had occasion to point out that Union Oil's supply route to Paraguay is one of the longest in the world, it being over 12,500 miles from Los Angeles to Puerto Casado by water and every cargo requiring a minimum of four or five transshipments.

I left Asuncion on March 11 by Pan American Brazil, arriving on March 16 in Miami, Florida. The entire trip to and from the Chaco had measured approximately 21,000 air miles.

The Puerto Casado "limited" must content itself with a diet of wood until we can produce local sources of petroleum fuel.

This hard-working "truck" at Conception consists of an ancient wood-burning steam roller with one or more trailers in tow.

Native Indians eke a bare existence from the Chaco, live in squalid huts and migrate continually through the jungles.



Exploring Davy Jones' Locker

Shock waves, rebounding from deep underground, are recorded on a seismogram. Field Manager Jay Boring of United Geophysical points to a portion of the record that will interest Union Oil.

BELIEVE it or not, Mr. Ripley, but if it were not for earthquakes oil men today would have no means of exploring ocean bottoms for new sources of petroleum.

Throughout all ages, people have lived in great ignorance and awe of earthquakes. We are not thoroughly enlightened and fearless even today. But at least a progressive step was taken as far back as A. D. 132 when Chang Heng, a Chinese, invented a form of seismoscope (earthquake viewer), the purposes of which were to verify that a quake actually had happened and to indicate the direction from which it came.

On down through the centuries we find evidence of other instruments and experiments being made in various parts of the world. Crude seismographs (earthquake-recorders) were invented, which began to tell man something about the extent, severity and duration of these phenomena.

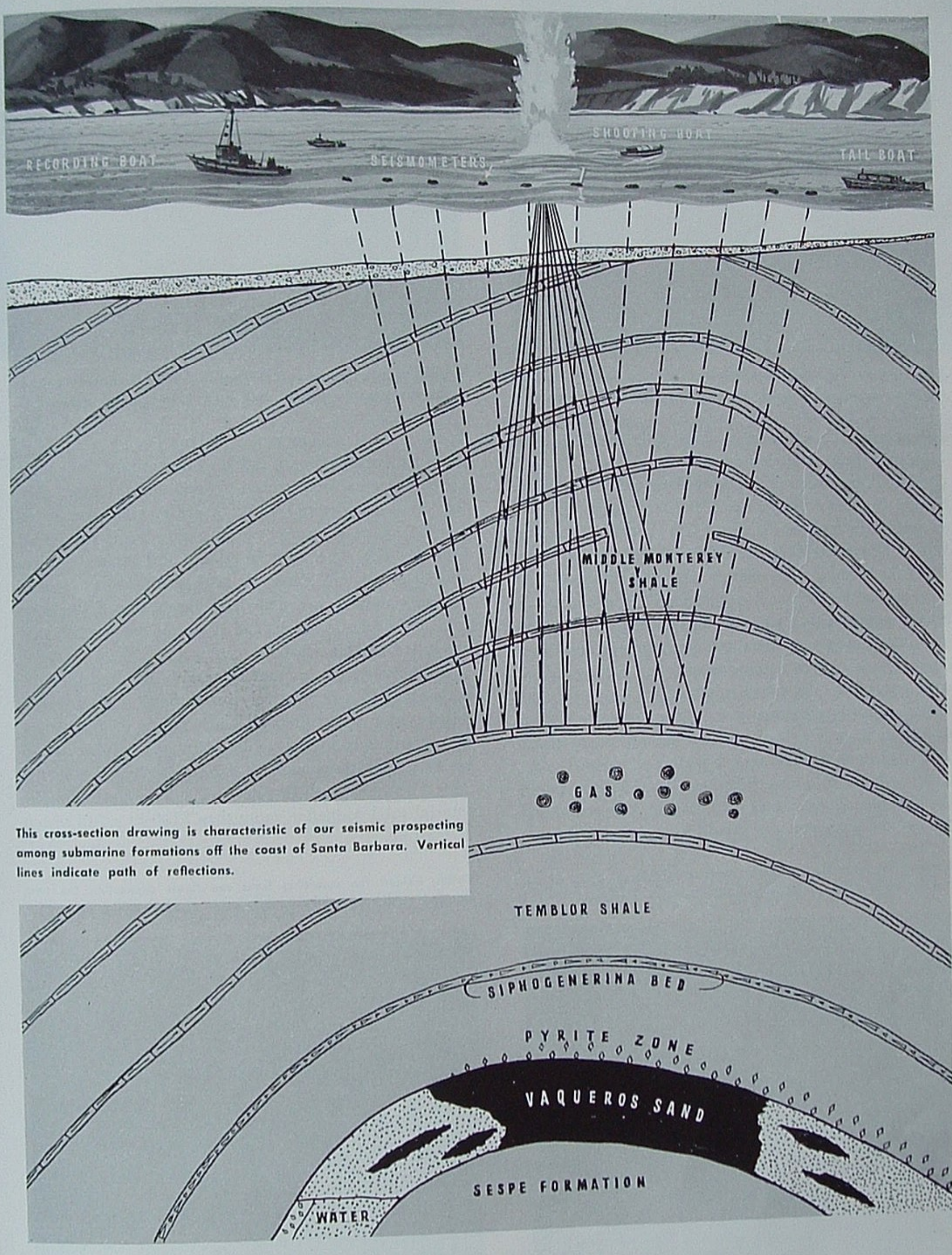
Then in 1761 John Michell, an Englishman, wrote in one of his scholarly papers the interesting comment that all rock has elastic properties and that earth tremors are transmitted through the earth's crust in the form of elastic vibrations.

In about 1855, while Palmeiri was designing and building some greatly improved seimographs in Italy, another scientist, Robert Mallet, decided that much could be gained if observers, instead of waiting for quakes to happen, could produce artificial tremors at will. Mallet therefore exploded some heavy charges of gunpowder, found that such shocks had many characteristics of an actual quake, and thus suggested the modern science of seismic exploration.

As with many other advancements, it required a war to bring about some of the practical applications of seismic knowledge. Toward the close of World War I, German specialists attempted to locate the positions of enemy artillery by recording and plotting earth tremors caused by the firing and recoil of big guns. Simultaneously, McCollum, Karcher and Eckhardt, working for the U. S. Bureau of Standards, were trying to solve the same war problem by tracking sound waves. Both efforts were moderately successful and, since it had been proved that earth tremors traveled at various speeds through different types of rock, it was suggested that the plotting of explosion tremors through sections of earth might give a clue as to the type and position of underlying rock strata.

A few underground mapping tests were made before the idea was applied to oil exploration. As early as 1921, Eckhardt made an exploring test for the Marland Oil Company in Oklahoma, but produced no satisfactory results. Then in about 1923 the theory was again tested along the Gulf Coast with greater success. Later, tests conducted in Oklahoma from 1927 to 1930 yielded a number of producing wells and established seismic exploration as a useful arm of the petroleum industry. Since then many new producing fields have been discovered by this method.

The extension of seismic mapping to lake and ocean bottoms, lying in some cases under several hundred feet of water, at one time seemed impossible due to the supposed cushioning effect of water to tremors. However, it was known that earthquake shocks are transmitted with great force even through deep water. Ships at sea have reported many strong earthquakes during which the rumbling and shaking were quite as pronounced as on land. Similarly, shock waves from



This cross-section drawing is characteristic of our seismic prospecting among submarine formations off the coast of Santa Barbara. Vertical lines indicate path of reflections.

Boats of the exploring fleet communicate via radio telephone. Manager, above, directs work from darkroom of recording boat.

A party member measures angles to established landmarks in order to fix the exact location of each ocean-bottom sector explored.

an explosion at sea seem to lose little of their force while traveling through water.

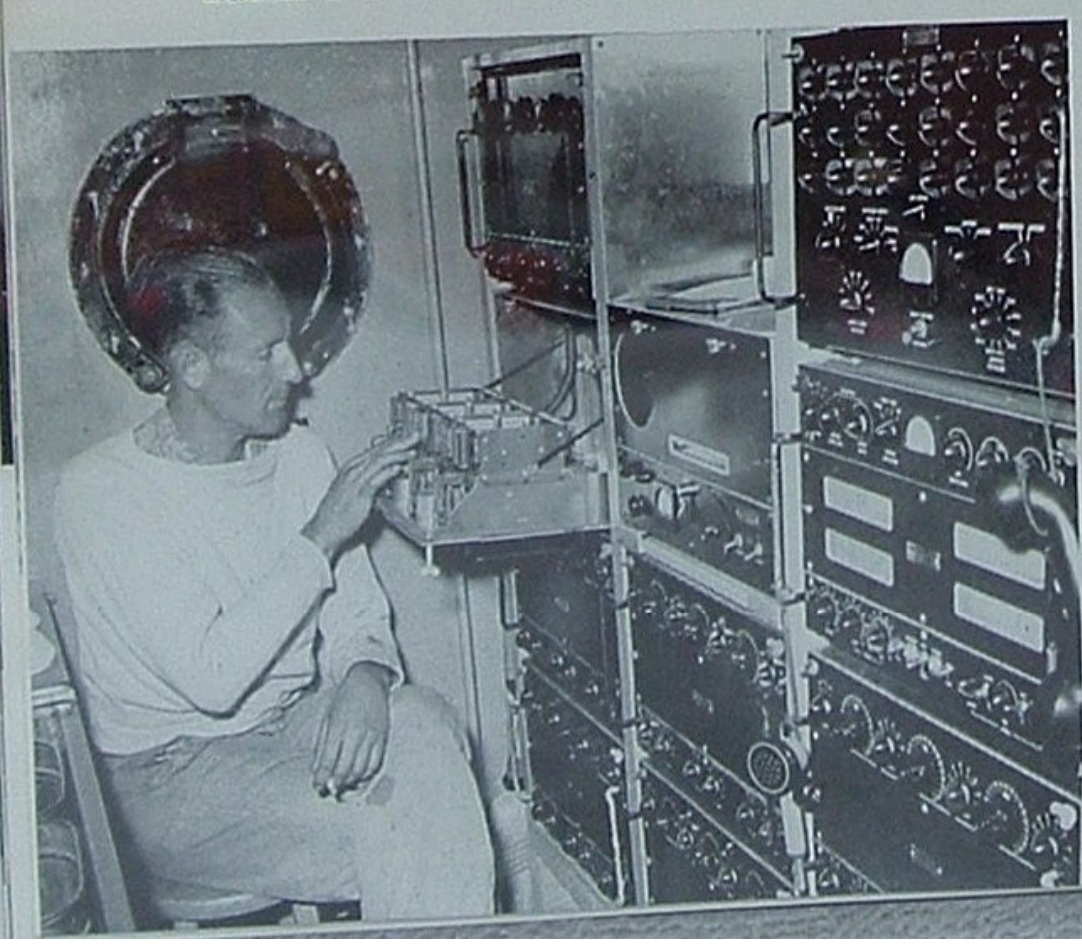
SEISMIC prospecting, as being done today for Union Oil Company off the Santa Barbara Coast, employs an explosive product such as Du Pont's "Nitramon WW." This material is packed in charges varying from 10 to 50 pounds. The charges are remarkable in that they cannot be exploded accidentally by dropping or even if struck with a rifle bullet. On board the "shooting" boat, charges, primers and blasting caps are stored separately to prevent accidents and are not assembled until just prior to a scheduled shot.

Marine exploring usually calls for a fleet of about six boats. A survey boat precedes the others by a day or several hours and marks the section of ocean bottom to be explored by setting out lines of red buoys. Later, the recording boat, largest of the fleet and containing most of the personnel and recording equipment, locates the first of these buoys and begins paying out a seismometer (or geophone) cable. The trailing end of the seismometer cable is picked up and held in exact position by a smaller tail boat. A craft called the jetting boat is specially equipped to plant deeply-submerged charges. The shooting boat plants near-surface charges and detonates all shots. A sixth craft functions as a service runabout, accommodates inspectors of the State Fish and Game Division, and picks up the few fish that are killed by this blasting.

Incidentally, the amount of marine life destroyed by these operations is relatively insignificant. The few fish killed within an explosion's short radius of destruction are immediately picked up by boats and sold at nearby markets. All revenue from these sales is given to the State Fish and Game Commission, but rarely is the piscatorial catch valued at more than $100 in a full month of blasting.

This panel of recording boat instruments is capable of taking seismic dictation at the rate of one thousand reflections a second.

Visible behind the recording boat are floats supporting the seismometer cable. Seismometers are suspended below the surface.



A seismometer cable may consist of approximately 11 individual seismometers spaced 100 feet apart and constructed to float on the water's surface, or may include three times that number, installed in sets of three on platforms that remain several feet under the surface. Each seismometer, or set of three as the case may be, is connected individually with recording apparatus on the recording boat by means of insulated electric wiring. Near the middle of the cable is an upright marker used to guide the shooting boat in exploding its charges.

When all is in readiness—the seismometer cable in exact position in relation to the buoys, the recording instruments set, the charge, primer and blasting cap assembled—a standby order is telephoned from a control man on the recording boat.

In a moment the shooting boat speeds away from a spot where it has just dropped a charge. As it reaches a safe distance of about 300 feet, the order to fire comes over the phone and loud speaker system. Instantly those within the immediate area sense the slight jar of an explosion followed by a report not unlike distant naval gunfire. It is an extremely weak substitute for an earthquake, but the sensitive seismometers, actually capable of picking up a fly's footfalls as it walks across the instrument, require nothing more violent. If the charge is exploded under fairly deep water, no surface disturbance is visible. However, if the charge is placed in shallow water or floated close to the surface, a geyser of water rises to spectacular heights. Deep shots are not preferred by seismic crews because the rising of bubbles through water produces meaningless reflections on the record. But near-surface shots kill more fish and are forbidden in waters shallower than 100 feet.

Almost before a sound is heard and the geyser begins to recede, seismic apparatus has completed its recording in the following sequence:

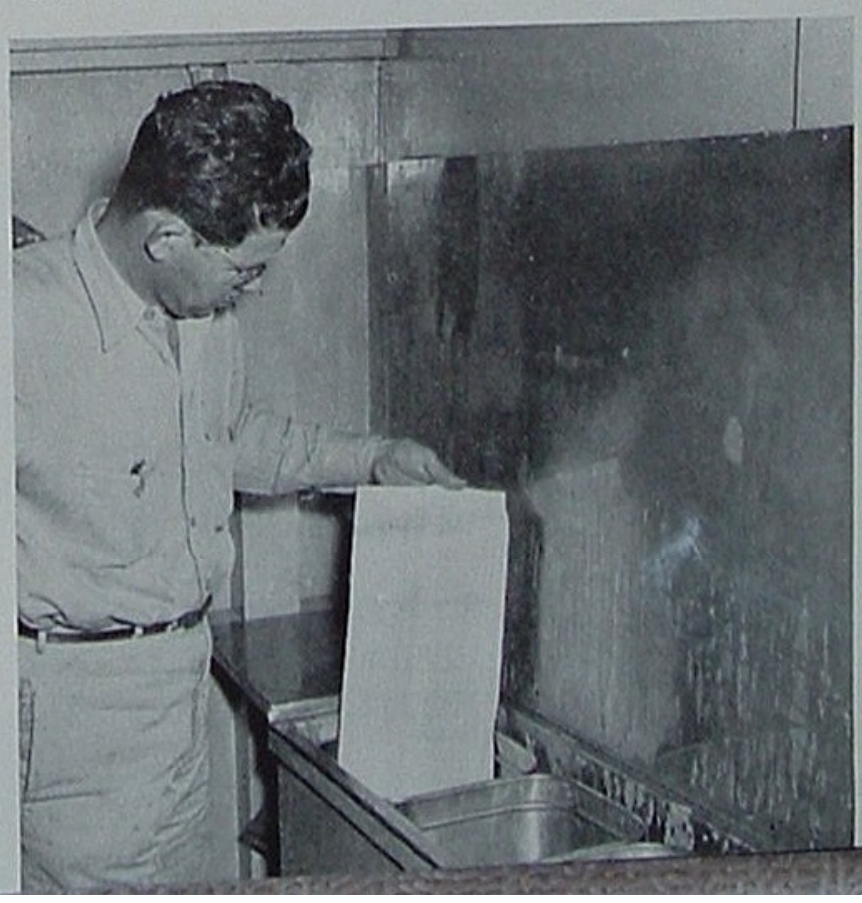
An exploding charge sends shock waves down through underground strata. As the waves strike dense substances, some are reflected immediately back to the surface while others continue further down to be thrown back by deeper strata of rock. Under favorable conditions and if a large explosive charge is used, the reflected waves can be recorded from depths of 15,000 feet or more. Picked up by seismometers floating on the ocean's surface, these vibrations are converted into electrical impulses and hasten on to the recording boat. Here the impulses are amplified, converted to light beams by a reflecting galvanometer, and recorded in the form of wavering lines on a moving roll of film or sensitized paper. The reflected waves bounce back in such rapid succession that the many series of shocks appear as continuous lines across the record, one line for each seismometer in action. The shapes of curves, peaks and dips in these lines are evidence to the geophysicist of the types of rock through which shocks have passed.

As time is the essence of seismic recordings, the sensitized paper with its ruled lines must indicate the arrival time of each series of waves to an accuracy of 1/1000 of a second. This time-wave correlation tells the geophysicist how deep each layer of rock is in relation to other rock strata.

After being developed, the record, called a seismogram (earthquake-letter) is hardly as readable as your morning newspaper. Its complicated series of dips and peaks can be translated into an accurate cross-section of submarine strata only by a trained and experienced geophysicist. And even a geophysicist cannot guarantee the presence of oil. He is limited solely to finding suitable salt domes or anticlines (inverted cup-like formations of rock) where there is some possibility of oil being trapped.

Using a three-arm protractor, a party member plots position of the recording boat with relation to shore control stations.

Sensitized recording paper emerges from developing solution showing trained observer where favorable oil structures exist.



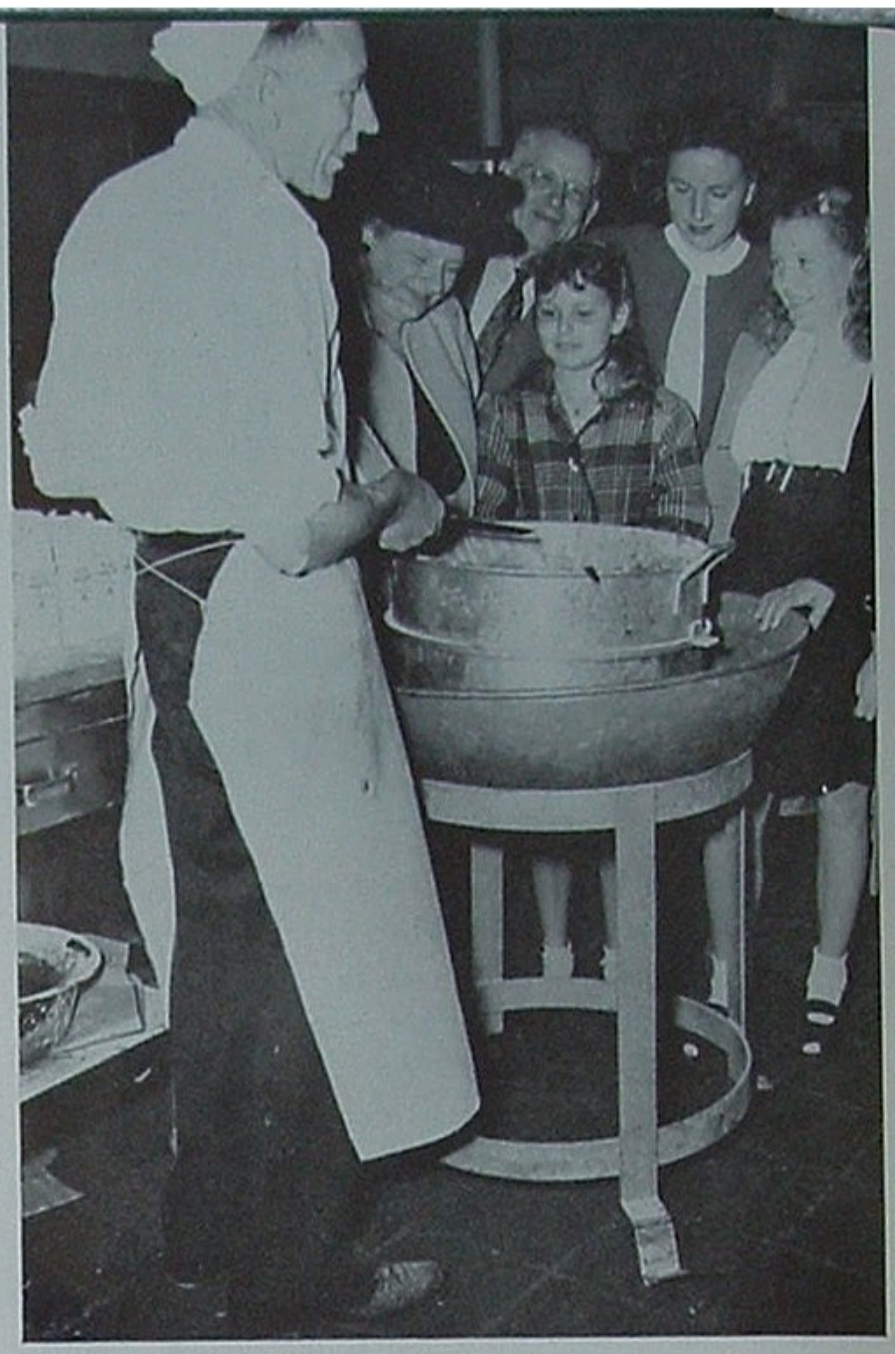
FAMILY DAY

By Gale Peterson

Convinced that a great deal of the Company's success, present and future, depends upon the families and friends of employees, Los Angeles Refinery played host on June 5 to well over 3,000 pleased visitors.

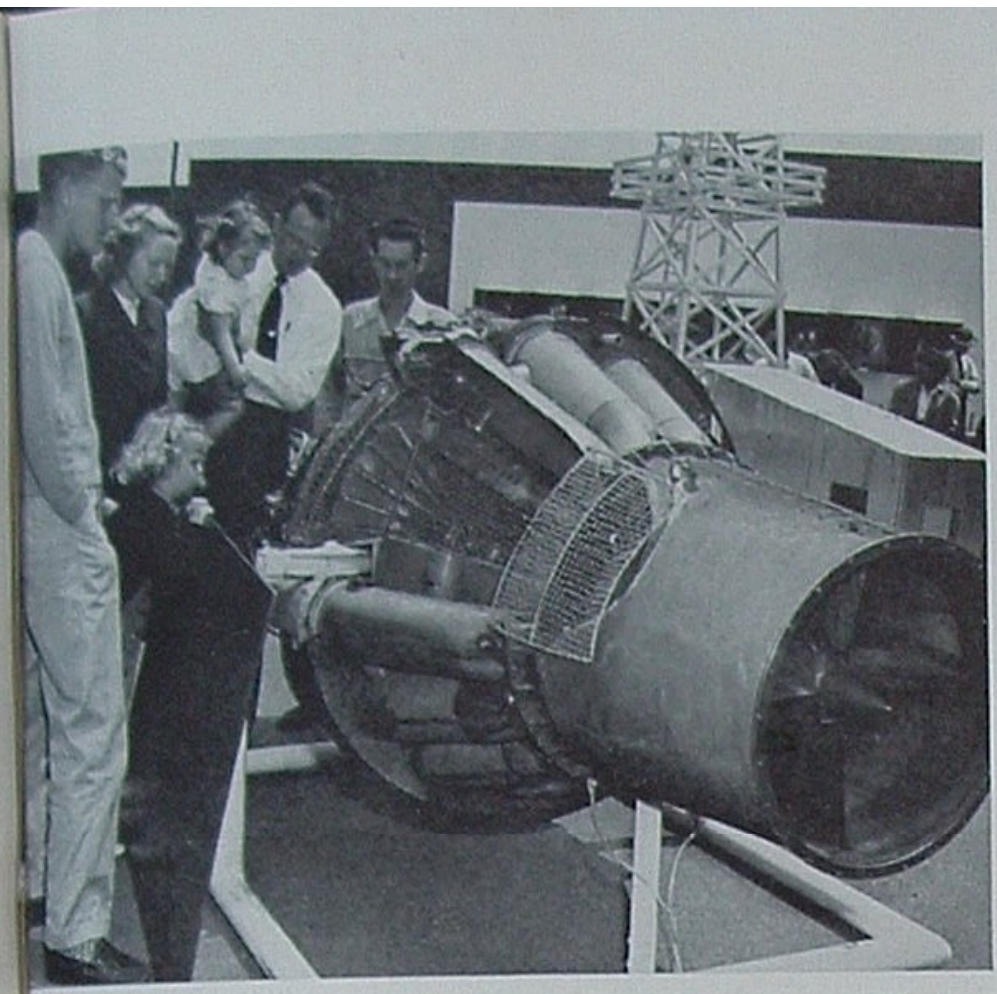
Customary county fair transportation facilities were far surpassed when the guests found themselves making tours of various units and departments in 10 Greyhound busses chartered for the occasion. Shops and laboratories provided special exhibits to illustrate their work. Besides our general exhibits of products, equipment and operating units, Ethyl Corporation supplied an excellent fuel testing exhibit, and DuPont's "Magic in Chemistry" played to an audience of over 1,200. Highly popular throughout the day were the Speakers Club's tape recorder, a trick pony furnished by the Trail Club, movies and free refreshment stands. Those who had energy to spare after an exhibition softball game went on to Palos Verdes Country Club for an evening of dancing.

Judging by some of the comments overheard, few visitors will ever forget their walk through the TCC Unit control house, nor the 8 by 10 picture of a single hair on a mosquito's wing taken with the electron microscope, nor the motor that has run the equivalent of eight round trips to the moon.

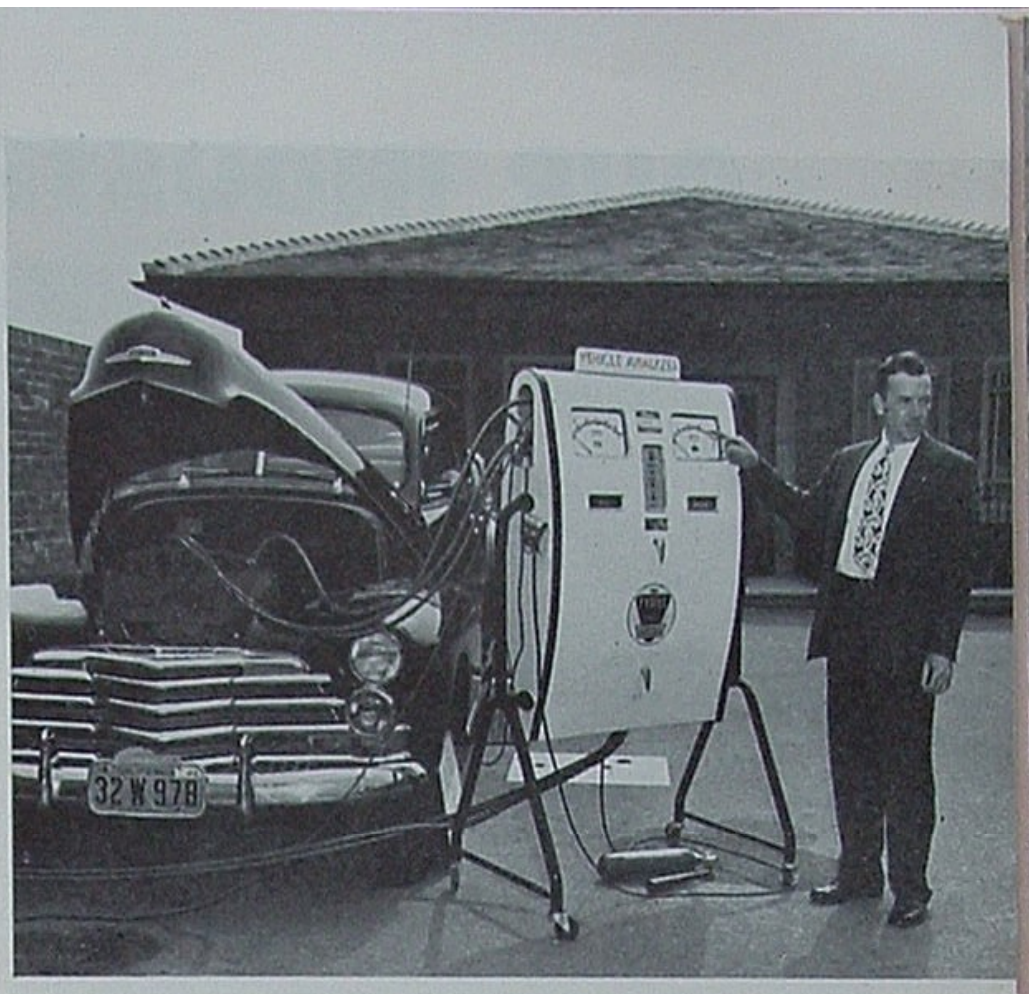


A "cook's tour" of the cafeteria revealed why dad no longer insists on getting the family up to prepare his lunch pail.

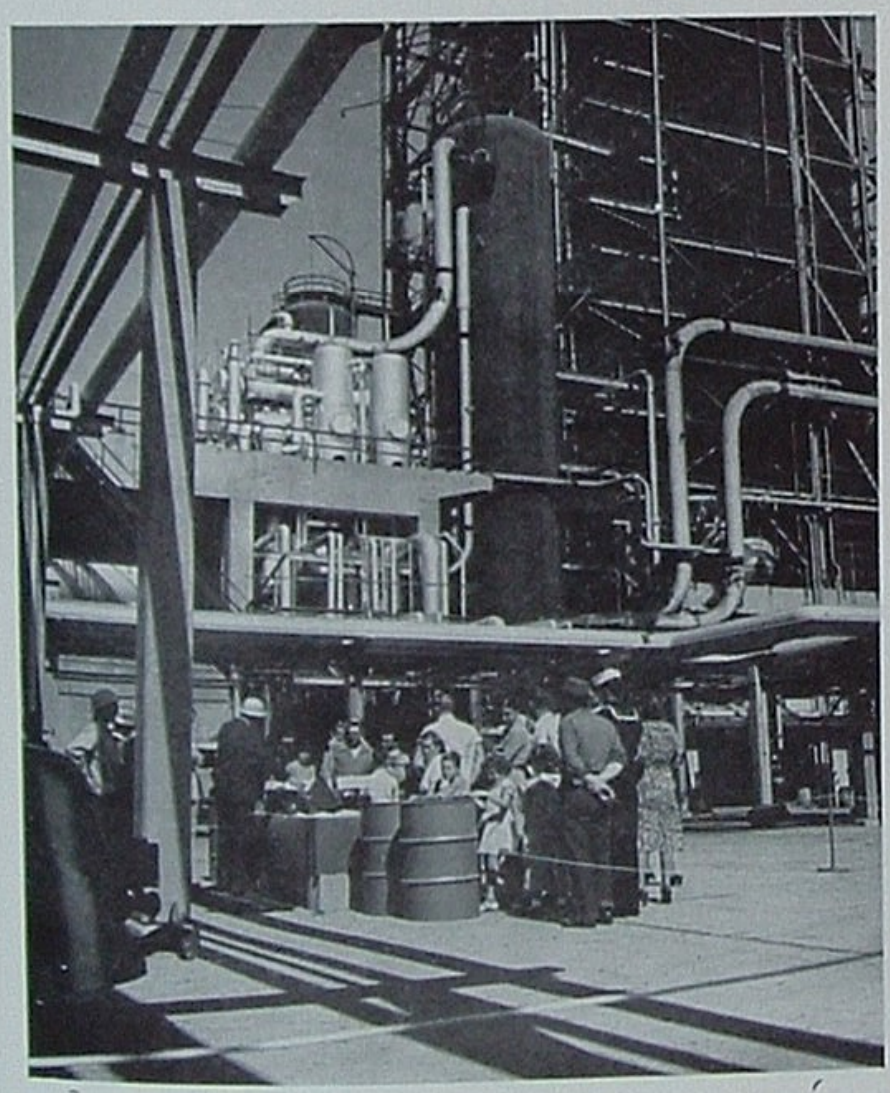
DuPont's interesting "Magic in Chemistry" and an attractive hostess induced many to see the show a second time.



General Electric's new jet-turbine engine set minds to marveling at the great engineering achievements of this age.



Ethyl Corporation demonstrates their vehicle analyzer by which motor and fuel efficiencies can be tested with exactness.



One of the day's biggest thrills was a walking tour of the massive Thermofor Catalytic Cracking Unit and control room.

"Looks like it ran between two streetcars," said one youngster of this John Deere cutaway tractor, designed for a host of labors.

OUR INDUSTRIAL SUMMARY

One of the new warehousing facilities recently completed as part of the extensive modernization program at Oleum Refinery.

MANUFACTURING During May crude processed and products produced at the Los Angeles Refinery were slightly in excess of the amounts planned for the month . . . The catalytic cracker treater in which the catalyst flow was changed from countercurrent to concurrent indicates that the change was beneficial and the percentage of gasoline produced has increased . . . Good progress is being made in the repair of damage caused by the fire at the Combination Cracking Unit at the Los Angeles Refinery on June 2nd . . . The repaired section will be in operation about July 19th . . . While there has been a loss in crude throughput capacity and products manufactured as the result of the fire, our position in the market has not been impaired . . . Operations at Oleum during May were a little better than anticipated by the plan . . . Construction work on the new Triton plant is getting underway and it is anticipated that the planned construction schedule will be maintained . . . While steel and other materials needed in the construction have been difficult to obtain, much of this difficulty has been overcome . . . The new warehouse at Oleum has been completed and is in use and the large addition to the Oleum office building is coming along.

INDUSTRIAL RELATIONS Atlantic and Gulf Coast tanker operators having labor agreements with National Maritime Union completed negotiations and signed a "Memorandum of Understanding" early in June. Union Oil agreed to accept the terms of the Eastern settlement and a "Memorandum of Understanding" was executed. Since there is a difference of opinion as to the legality of the "hiring hall" clause, the question may have to be decided ultimately by the courts. In view of this uncertainty, the Company decided to consent to the inclusion of this clause in its present contract pending clarification of the issue . . . Negotiations with Marine Engineers' Beneficial Association were successfully concluded early in June and a contract was executed effective until March 31, 1950, subject to wage re-opening after February 1, 1949. A maintenance-of-membership clause was substituted for the former closed-shop arrangement . . . Contract negotiations were held during May and June with the Independent Union of Petroleum Workers representing employees in our Field, Pipe Line, Automotive and Purchasing Departments. Tentative agreement was reached on several of the issues discussed and negotiations were continued into July . . . Two "union authorization" elections were held recently by the National Labor Relations Board to determine the right of Oil Workers International Union to bargain for "union security" agreements covering certain employees at Oleum and Los Angeles Refineries, and at the Los Angeles 6th and Mateo Terminal. These elections authorized the bargaining agency to seek such agreements.

PURCHASING The general supply situation, except for pipe, is better than it has been for several years . . . During May the party at our shale property in Western Colorado was outfitted with surveying instruments, camping equipment, office equipment and supplies . . . Approximately 100 tons of supplies were recently loaded on several of the smaller vessels purchased by the Paraguayan Government, and it is believed that our efforts in shipping all available cargo on these vessels will reap good returns . . . On May 14th the Northern Division Pipe Line warehouse at San Luis Obispo was completely destroyed by fire, resulting in a loss of approximately $80,000.

RESEARCH Research has just completed the development of a new barium grease which will be considerably simpler to manufacture than the present Unoba and which exhibits greater mechanical stability and improved pumpability in comparison with our present all-purpose automotive grease, Unoba A. If results of limited tests so far completed are confirmed by exhaustive field tests now in progress, it is anticipated that the new grease will replace both of the existing products in the future . . . Two superior drilling fluids have been formulated recently by Research. A well drilled with one of them has proved to be the best

producer in its field . . . The Hypersorption Process developed by Research for the separation of the components of mixed gases has gained wide recognition by the petroleum and chemical industries. Two commercial units are already in operation, one at the Dow plant at Midland, Michigan and the other at the Rohm and Haas plant at Pasadena, Texas. The versatility, the relatively low capital investment cost, and the simplicity and efficiency of its operation are all factors which have combined to attract interest in the Hypersorption Process.

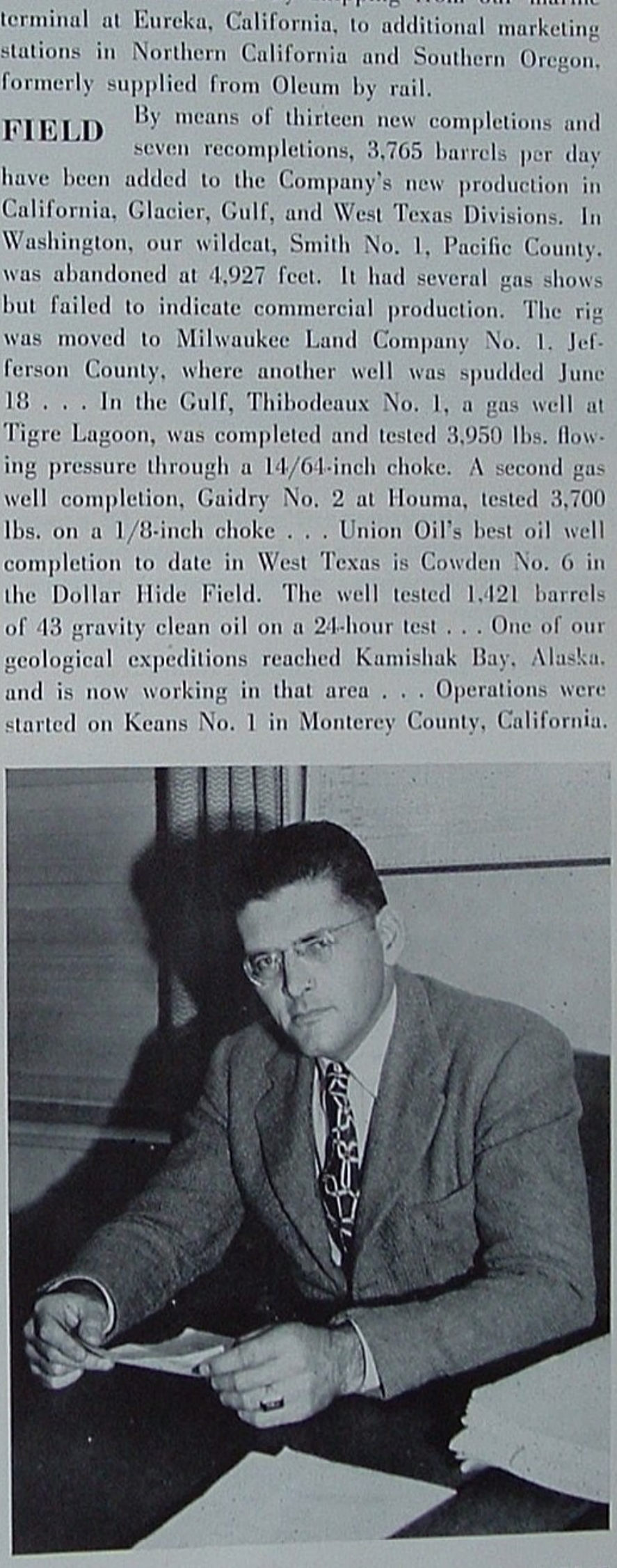
MARKETING A net decrease in sales of Union Oil products during May of 25,516 barrels (0.7%) brought our year-to-date decreases to 896,990 barrels (4.5%). Gasoline sales exceeded May of 1947 due to purchases by Imperial Oil Company, Ltd., and the U. S. Government. Sales of Technical Products, kerosene and fuel oil declined sharply, while sales gains were made by stove oil, Diesol and lubricating oils, the latter improving 76 per cent. Grease sales also increased 12 per cent . . . No storage tanks were lost during the Northwest floods. The Willbridge (Portland) terminal operated continuously although a portion of the plant was flooded.

PIPELINE A new 113,000 barrel floating-roof tank was completed and placed in service at Avila. It eliminates the corrosion problem experienced with cone-roof tanks . . . A pipe line and gas-engine-driven shipping pump were installed to handle production from Western Gulf Oil Corporation property in the Paloma Field.

MARINE After completing a voyage to Guatemala, the SS Santa Paula entered drydock for painting, installation of deck capstan and radio marine telephone . . . The telephone installation marked the complete equipping of our entire fleet with this facility affording prompt person-to-person communication with all ships and shore stations within radio-telephone range . . . This ship-to-shore communication proved particularly valuable recently when Captain E. H. Fulton, master of our SS Oleum, was stricken seriously ill while en-route from Seattle to Los Angeles.

DISTRIBUTION Despite extreme flood conditions on the Columbia River, our stocks in Northwest marketing stations proved adequate . . . A saving of $20,000 per year in transportation costs has been effected by shipping from our marine terminal at Eureka, California, to additional marketing stations in Northern California and Southern Oregon, formerly supplied from Oleum by rail.

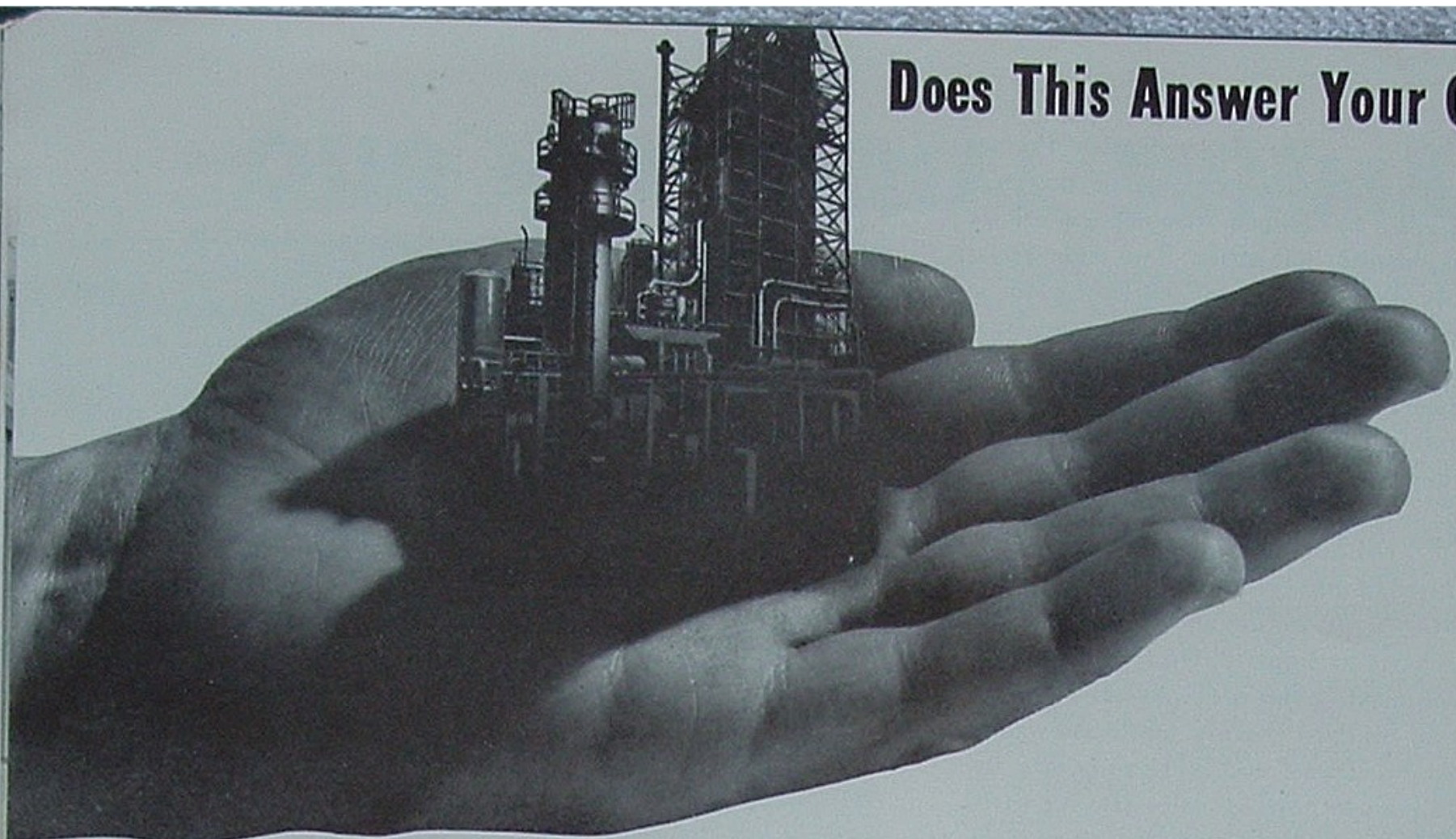
FIELD By means of thirteen new completions and seven recompletions, 3,765 barrels per day have been added to the Company's new production in California, Glacier, Gulf, and West Texas Divisions. In Washington, our wildcat, Smith No. 1, Pacific County, was abandoned at 4,927 feet. It had several gas shows but failed to indicate commercial production. The rig was moved to Milwaukee Land Company No. 1, Jefferson County, where another well was spudded June 18 . . . In the Gulf, Thibodeaux No. 1, a gas well at Tigre Lagoon, was completed and tested 3,950 lbs. flowing pressure through a 14/64-inch choke. A second gas well completion, Gaidry No. 2 at Houma, tested 3,700 lbs. on a 1/8-inch choke . . . Union Oil's best oil well completion to date in West Texas is Cowden No. 6 in the Dollar Hide Field. The well tested 1,421 barrels of 43 gravity clean oil on a 24-hour test . . . One of our geological expeditions reached Kamishak Bay, Alaska, and is now working in that area . . . Operations were started on Keans No. 1 in Monterey County, California.



NEW MANAGER OF CALIFORNIA FIELD OPERATIONS

On July 9, Basil Kantzer, former chief production engineer, was appointed manager of California Field Operations. He succeeds W. J. Larson who has resigned to go into private business. To take Kantzer's former place, J. E. Sherborne has been appointed chief production engineer.

Basil Kantzer, born August 19, 1912, in Salt Lake City, is a graduate of Lowell High School, San Francisco, Stanford University and University of Southern California. He joined Union Oil Company in June, 1934, at Santa Fe Springs in a field assignment. After serving there and at Dominguez for two years, he filled a petroleum engineering assignment in Los Angeles in 1936, was appointed production engineer and production foreman at Santa Maria in 1937, district production foreman at Bakersfield in 1942, and chief production engineer at Los Angeles in 1944.



Does This Answer Your Question?

Here are management's answers to some of the questions asked by employees during recent showings of the motion picture, "Report for '47".

Who picked the proxy committee named on proxies for the last annual shareholders' meeting?

The proxy committee consisted of four directors—Reese H. Taylor, W. L. Stewart, Jr., John Earle Jardine and Gurney E. Newlin. They were appointed by the Board of Directors.

In the near future ON TOUR will publish a feature story introducing our directors and telling how and why they were elected.

Is the percentage of employees owning Union Oil stock higher than in most other companies?

With more than 2,000 Union Oil employees, or approximately 25 per cent, owning Company shares, we believe that we have one of the highest percentages of employee-owners to be found among corporations of comparable size.

What is the dividend per share of common stock?

In 1947 the Company paid $1.10 per share in dividends on common stock, three of 25 cents each and one of 35 cents. In the first nine months of 1948, a total of $1.32½ will have been paid in dividends, two of 35 cents each and one of 62½ cents. Dividends on preferred stock are fixed at the annual rate of $3.75 per share.

Why does an employee have to purchase Union Oil Company stock through a broker?

It is not necessary to purchase our stock through a broker. Any person is at liberty to sell his shares to any other person. However, stock brokers do perform the very necessary function of bringing the buyer and seller together, thereby assuring marketability of the stock. Under the law, the Company cannot trade in shares of its own stock.

When a stockholder sends in his proxy, can he also attend the stockholders' meeting?

Yes. The signed proxy is suspended if the shareholder is present at the meeting and elects to vote in person. It may also be revoked by the shareholder at any time prior to the exercise thereof.

Why did the Sales Department contact shareholders in regard to proxies?

As a part of the Company's shareholder relations program, a great many of our 25,000 stockholders who reside in the marketing area, including employees owning stock, were contacted by our marketing representatives and members of management. The primary purpose was to bring about a closer relationship and better understanding by personally informing the shareholders about Union Oil Company and the petroleum industry in general. Simultaneously our representatives encouraged shareholders, including employee-shareholders, to take an active part in the Company's procedures by voting at the annual meeting.

Why were dividends increased?

The Company's dividends represent the amount of money left for the owners from sales of our products and services after purchases have been paid for, operating charges have been met, interest has been paid on borrowed money, reserves have been set aside for replacing worn out equipment and exhausted oil producing properties, all taxes have been met, employees have been paid their wages and benefits, and enough money has been left in the business for improvement and betterment as well as for contingencies. This remaining profit belongs properly to the owners of our business, the shareholders. Over a period of the past 20 years, Union Oil dividends have been paid as follows:

1929—$2.00	1939—$1.05
1930— 2.00	1940— 1.00
1931— 2.00	1941— 1.00
1932— 1.20	1942— 1.00
1933— 1.00	1943— 1.00
1934— 1.00	1944— 1.00
1935— 1.00	1945— 1.00
1936— 1.00	1946— 1.00
1937— 1.40	1947— 1.10
1938— 1.20	1948— 1.32½ (three quarters)

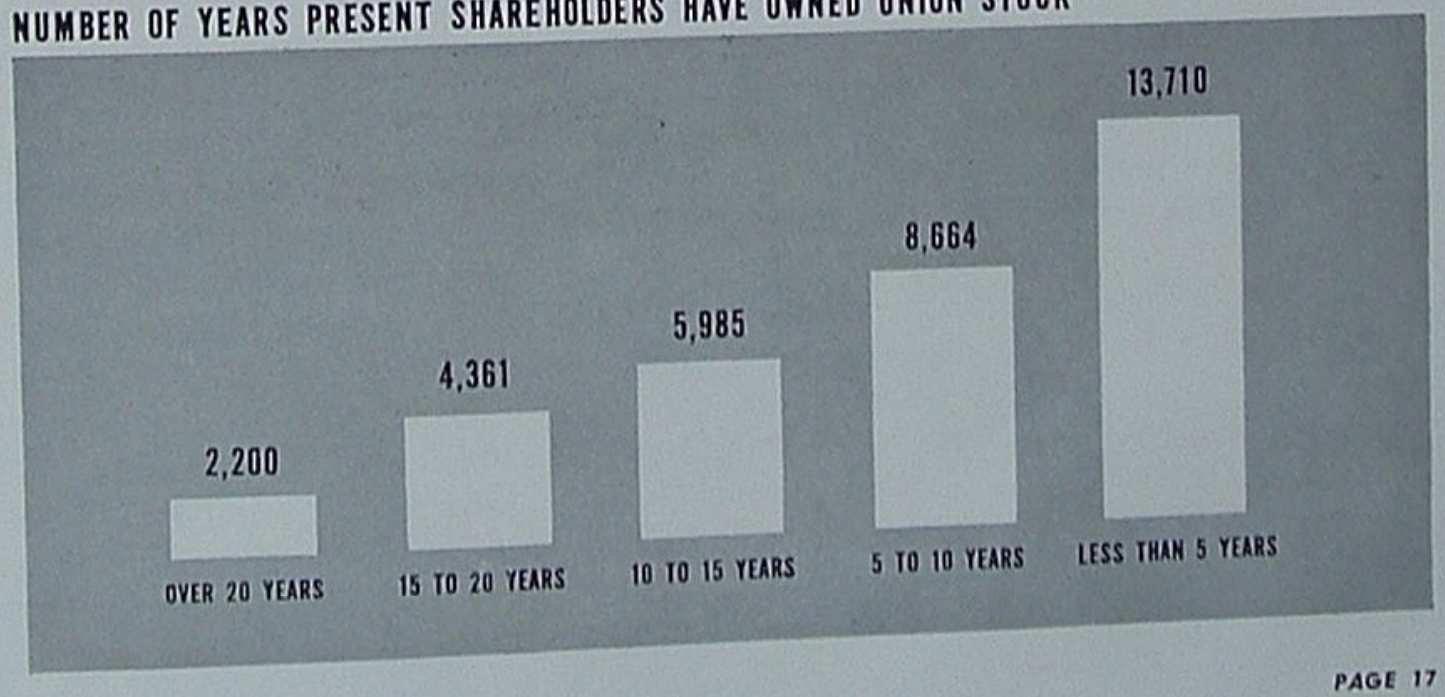
The foregoing shows that our shareholders took a rather drastic cut in earnings following 1931 and throughout the years of depression and war. Even since 1941, when wages and incomes from other sources were rising, our dividends did not keep pace but were held at a $1.00 per share rate. We had a relatively good year in 1947 and will pay a comparatively higher dollar dividend in 1948. But here again the picture may be misleading. Based on the purchasing power of the dollar, a $2.00 dividend in 1948 would have little, if any, more purchasing power than a $1.00 dividend had in 1938. In the final analysis, a company that seeks to improve and expand its operations must pay a fair return to its owners just as it must pay fair wages to employees. Failing in either, its position as a successful enterprise would be impaired. This would mean that additional capital to provide for growth and expansion would not be obtainable, for investors only invest their savings where they may expect to receive a good return.

Does any other oil company own a controlling interest of stock in Union Oil?

No. As of January 1, 1948, Union Oil Company was owned by 34,920 holders of common shares, mostly ordinary Americans from every walk of life. Approximately 14 per cent of the outstanding common shares was held by 793 stockbrokers, partnerships, corporations, educational, religious and charitable institutions, labor unions and other organizations. The remaining 86 per cent was owned by 32,450 individuals and 1,677 trusts and estates. The largest individual shareholder owned approximately 1 per cent of the common stock. Shares in lots of an even 100 were owned by 6,293 individuals. The combined holdings of all directors and officers of the Company amounted to 4½ per cent. Thus, no company or individual owns sufficient of our 4,666,270 outstanding common shares even to approach a controlling interest.

What caused Union Oil stock to increase in price?

Like all other stocks purchasable on the open market, Union Oil shares fluctuate in price according to many real and imaginary factors. The recent rise of Union Oil stock has been due to the gradual removal of some wartime restrictions, a sharp increase in demand for petroleum products, increased crude reserves, satisfactory labor relations, steady and efficient production, improved products, better prices, etc., all of which tend to increase earnings and promote public confidence in our future.



Columbia River Flood

By Gudrun M. Larsen

The S. S. OLEUM stuck to its job of bringing vital Union Oil products to the flood-ravaged Northwest. Here at Willbridge Terminal she rides high above the periled dock.

On May 30th, waters of the Columbia River, reaching flood proportions, became too powerful for the river's supporting dikes. With practically no warning, water swept across the community of Vanport, on the outskirts of Portland, mercilessly uprooting and breaking everything in its way. It is nearly impossible to imagine the vastness of this flood—the value of houses and other buildings destroyed—the price in property damage and human lives. But one clear impression could be gained at the Portland airport, where only the very top of the Administration building stood above 20 feet of water.

At our Willbridge Terminal, John Maguire, superintendent, and his assistants kept a close watch on the rising river. There is usually a 25 foot clearance below our dock. When the accompanying picture was taken the flood had reached a depth of 29 feet, 9 inches and it continued upward to a final crest of 30 feet, 2 inches. Our dock remained dry by a margin of only 2 feet.

Jim Terry was on duty at the Terminal the day following Vanport's disaster, despite a strenuous night of rescue and first aid work. He and his wife, a nurse, volunteered immediately when they heard of the damage to this area. Dick Peterson, also of the Terminal, spent practically all of his off-duty time helping to bolster the dikes. Undoubtedly, many other Union employees were equally generous with their time.

The entire Columbia River basin suffered from ravaging waters; however, other communities were more fortunate in being warned than was Vanport.

In Woodland, Washington, where the overflow reached a depth of 8 feet, Stan Barlow, Northwest Territory aviation representative, arrived Friday prior to the floods. Army Engineers had warned that waters were liable to rise above the dikes on both the Lewis and Columbia rivers. Stan aided his relatives in evacuating their farm. First, 145 head of cattle were moved to high ground; then the milk house was cleared of all electrical equipment, including refrigeration and automatic pumping units. The house was stripped of all furniture and movable units, including doors and windows. As this home was nearest to the dike and had the only telephone in the vicinity, it was taken over as a headquarters from which U. S. Army Engineers could direct their work in the flooded area. Stan and his uncle slept on the floor in sleeping bags and, besides moving all of their equipment, also put in shifts at sandbagging the dikes. Shortly before noon on Monday, the 31st, the State Highway Patrol and Army Engineers warned everyone to leave. Stan left the house at 12:05 after seeing to it that all electrical switches were pulled. At 12:20 a dike gave way on the Lewis River, flooding the town of Woodland. On Tuesday, the Columbia River dike here also gave way.

Dick Peterson, loader, was one of many Union Oil employees at Willbridge and other locations who fought to keep gasoline flowing by day and rivers from overflowing by night.

Our plant at Woodland, which is Company owned property, is operated by Consignee Lee Chester. Lee is also mayor of Woodland, and throughout the emergency he was on 24-hour vigil with the Army Engineers, aiding in directing volunteer workers on the dikes and evacuating all that could be saved.

Mrs. Chester and the employees stayed on duty at our plant. They gave directions for saving as much Company property as possible and stayed with the job of supplying gasoline and oil for trucks and automobiles that were carrying out the evacuation of Woodland. Service stations were also kept open to serve the town.

According to our most recent report, the Company has been most fortunate in not losing any storage tanks during the Northwest floods. The Willbridge (Portland) terminal operated continuously although high water invaded portions of the plant.

It will be many months before the total damage of this great flood is known. Years of hard work may not entirely erase the damage. But if everyone works as well together in the reconstruction as they did in the emergency, America's great Northwest will become even greater.

Showing serious concern as the Columbia rises nearly to off-bounds are, top to bottom, John Maguire, superintendent, King Bailey, his assistant, J. L. Terry, dockman.

Our Willbridge dock was one of the few remaining in operation during the flood. At the high water stage, below, it was within two feet of the crest and probable destruction.

Union

THE LEADER Al Kincaid of Seattle tells us the above gasoline pump, owned by his uncle in Kennewick, was the first visible pump installed in the state of Washington. The picture was taken in 1921. Owner Beste inspected a similar air-operated pump in Cour d'Alene, Idaho, before investing $750 in this mechanical wonder. Note the price of Union gasoline back in the good old days also. The 30 cents per gallon painted on the pump was a one-day special to stimulate business and did not include State or Federal taxes.

PROMOTED George Williams, who was recently appointed resident manager at Astoria, Oregon, brings an unusual background of experience to this marketing assignment. After winning his college degree in chemical engineering, George joined the Company at Medford in 1938 as a tank truck salesman. He later was marketing station clerk at Marshfield and then transferred to Oleum Rifinery, where he did research and personnel work. Eighteen months on the Seattle sales force preceded his present assignment.

KNIT ONE, PURL TWO E. E. Jones, Industrial Service Representative at Los Angeles, brought his knitting out the other day and, like the little bear that sat on the ice, his tale was told. Herb was a prisoner in a Jap internment camp for 42 months. During this time he learned to knit socks and other items of wearing apparel using ordinary store string in place of yarn. He'll now tackle anything, including a gal's sweater up to certain specifications. Herb was our foreign representative in Manila when the war broke out, and returned to Southwest Territory in February, 1946.

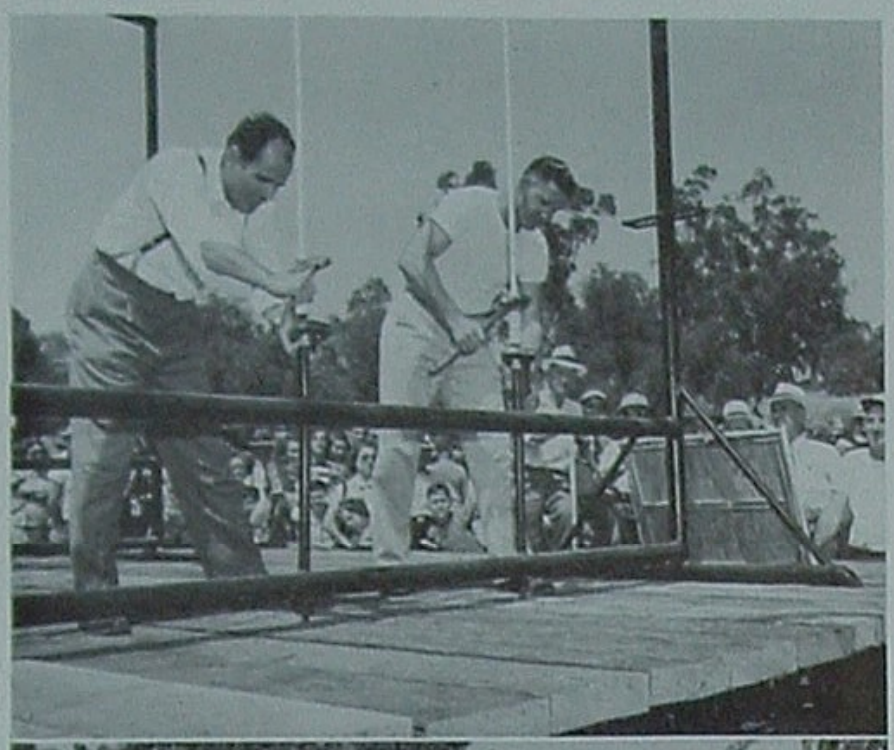
Oilers

GOING UP Seen ascending to gauge a storage tank at Coos Bay is Lee R. Matthews, recently appointed terminal superintendent at that marketing point. He was formerly order clerk at the Willbridge Terminal. Lee started with Union Oil in 1941 but, with many another employee, took several years' leave to serve with Uncle Sam. During the war he held the rank of captain in the U. S. Air Corps. Although an ardent basketball player, he regards 28 as about the proper age to be thinking of fishing and matrimony instead.

BEST IN NORTHWEST When the smoke cleared away from Redmond Golf Club's greens June 12, Tom Wise, center, was Union Oil champion of the Northwest with a low gross of 75. Sporting trophies of feminine supremacy were Ruth Groth, right, with a 95 low gross and Gudrun Larsen who took one stroke more and the low net prize. Some 85 employees enjoyed a great day beginning with a 6 a.m. breakfast at the club. Competition between the refreshment and decoration committees saw hot dogs getting the nod.

GAUGING THE GAUGERS When the Lompoc pipe line gaugers assembled recently at a Pismo Beach conference, they characteristically relaxed by measuring each other's service records. The kid of the bunch was Lloyd E. Adams with a mere 15 years; Charles E. Correll was the senior gauger with 34; and the entire group averaged exactly 25 years of continuous Union Oil service. They are, clockwise, right to left: Correll, C. Truesdale, T. Truesdale, Luzardi, Clevenger, Adams, Beirne, Frazier, Parsons, Stockton and Upchurch.

Union Oilers, Continued



BREA PICNIC It was a day of hard work to Jimmy Johnson and Fitz Fitzgerald, above, dead-heat winners of the rod-wrenching contest; but everyone else had nothing except fun at the Southern Division Field Picnic held June 13.

WHITTLER It remained for a transport driver to provide the Company's San Diego marketing office with the final modernistic touch. The building has recently undergone remodeling, including the installation of indirect lighting and the rearrangement of desks. Driver Bill LePage, standing above, glanced once at the new lineup of desks and noticed something lacking. Being an accomplished artist with wood, he set to work evenings carving the names of all sales representatives on name plates. These were finished in the Company's colors, orange and blue, and now serve a useful purpose, as shown in the above picture.

LIVING TARGET Robert S. Taylor, our division representative in southwestern Montana, questions the rule that "a potential customer is always right." In fact, he can give you the name and address of a chap who was wrong exactly twice. It seems that Taylor was riding his horse near the outskirts of Livingston when two rifle bullets of 30/30 caliber sped by, missing his bosom by unmeasured fractions of an inch. Our informer, Steve Connolly, doesn't state what Taylor did at this point to halt or avoid the barrage. However, Taylor's assailant, when captured and brought into court, testified as follows: "I don't see how I missed because I lead him at least a foot." Incidentally, the erring marksman was an insane veteran of World War I.

CARTOONIST Below are Herman Poe's impressions of how he did not apply to some Union Oil manager for his present Hyde Park job of retail representative. Poe wields a talented pen in his off hours and a number of his cartoons have been published in national magazines.

YOU THE BIRD THAT ADVERTISED FOR AN AGGRESSIVE YOUNG OIL SALESMAN ?

GOOD BADMINTON Seen shaking in the traditional badminton way are (L-R) Barbara Ulmer, Roy Houghton, "Tack" Tackaberry and Amy Lightner. Together with Liz Watson and Harold Sanders they captured all the major championships in this year's Union Oil Badminton Tournament. Houghton and Miss Watson were the singles winners, while the best doubles contestants were Misses Ulmer and Lightner and Messrs. Tackaberry and Sanders.

SERVICE BIRTHDAY AWARDS

JULY, 1948

Forty Years

Grant, Fergus, Coast Div. Field

Thirty-Five Years

Nelson, Roy O., Central Territory

Thirty Years

Conley, Wm. M., No. Div. Pipe Line
Elliott, Charles H., H. O. Comptroller's
Luttrell, Alfred S., Coast Div. Field
Weaver, Elmer H., H. O. Purchasing

Twenty-Five Years

Cyrus, Russell H., Marine-Wilmington
Diamond, Patrick, Oleum Refinery Mfg.
Gartin, Elmer N., H. O. Comptroller's
Harper, Earl R., Central Territory
Macaulay, Ronald, So. Div. Pipe Line
Malette, Alfred F., H. O. Comptroller's
Mello, Alfred V., Oleum Refinery Mfg.
Noble, Earl B., H. O. Exploration
Rhode, Alvin H., Northwest Territory
Rogers Lloyd J., Central Territory
Shepherd, Wm. A., L. A. Refinery Mfg.
Smith, Leslie A., L. A. Refinery Mfg.
Stine, Floyd M., So. Div. Field
Van Wagenen, Grant E., So. Pipe Line
Wagner, Louis, So. Div. Field
Wilson, Theodore R., L. A. Refinery Mfg

Twenty Years

Biehn, Stanley, Northwest Territory
Bond, Russell S., Northwest Territory
Bouvier, John A., So. Div. Field
Carroll, Lonnie L., L. A. Refinery Mfg.
Castor, Sylvia L., H. O. Comptroller's
Dougan, Agnes C., Maltha Refinery
Dyer, Orin L., L. A. Refinery Mfg.
Erickson, Arthur, Purchasing-Seattle
Haase, Carl, L. A. Refinery Mfg.
Hammond, Arthur C., L. A. Refinery
Johnson, Otis, So. Div Field
Kibbe, Morton H., H. O. Exploration
Lamb, Floyd A., Southwest Territory
Lillquist, Hugh E., Northwest Territory
McEwen, David C., Central Territory
McGee, James E., L. A. Refinery Mfg.
May, Ernest C., L. A. Refinery Mfg.
Pedersen, Harold, Oleum Refinery Mfg.
Philips, Wm. W., H. O. Comptroller's
Shea, Jack, Oleum Refinery Mfg.
Stricker, Ernest B., L. A. Refinery Mfg.
Trout, Daniel B., No. Div. Pipe Line

Fifteen Years

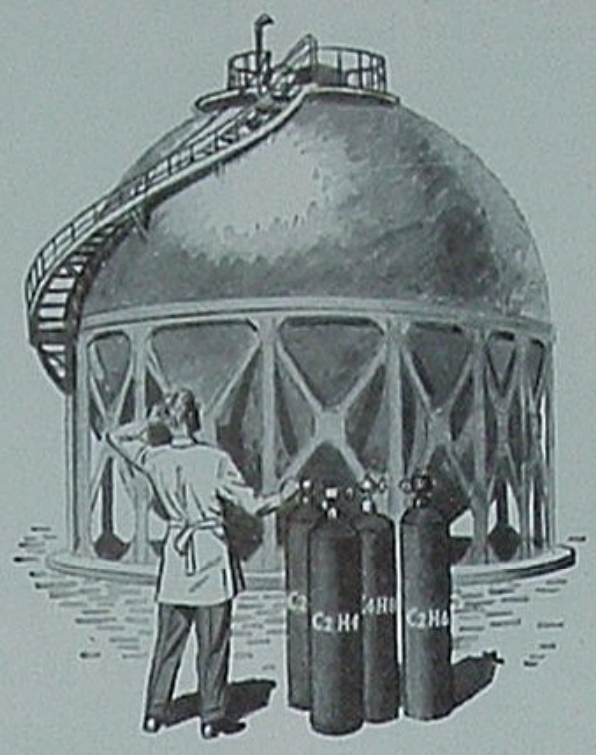
Bruce, Lawrence W., Central Territory
Coveney, Thomas R., Southwest Terr.
Davis, Clarence A., So. Div Field
Dill, Walter J. Jr., Central Territory
Fallis, Herbert E., Central Territory
Fish, George A., Central Territory
Germain, Wm. H., Southwest Terr.
Harkness, Dorothy V., H. O. Exploration
Hartsell, Norris V., L. A. Refinery Mfg.
Haynes, Raymond L., No. Div. Pipe Line
Hoisington, Earl P. Jr., Central Terr.
Janes, Laddy W., Southwest Territory
Kallicot, Alfred L., Northwest Territory
Lake, George R., Research-Wilmington
Le Beuf, Rosamond Y. B., Oleum Refin.
McLachlan, Elmer M., Central Terr.
McNamara, Michael S., Oleum Refin.
McNeill, James, So. Div Field
Ono, Tokuzo, Honolulu Dist.
Parrett, Kenneth W., Southwest Terr.
Sly, Sibbald A., Southwest Territory
Smith, George S., Central Territory
Springmann, Frederic L., H.O. Sales Ser.
Williams, Ralph D., L.A. Refinery Mfg.
Young, Leon M., Oleum Refinery Mfg.

Ten Years

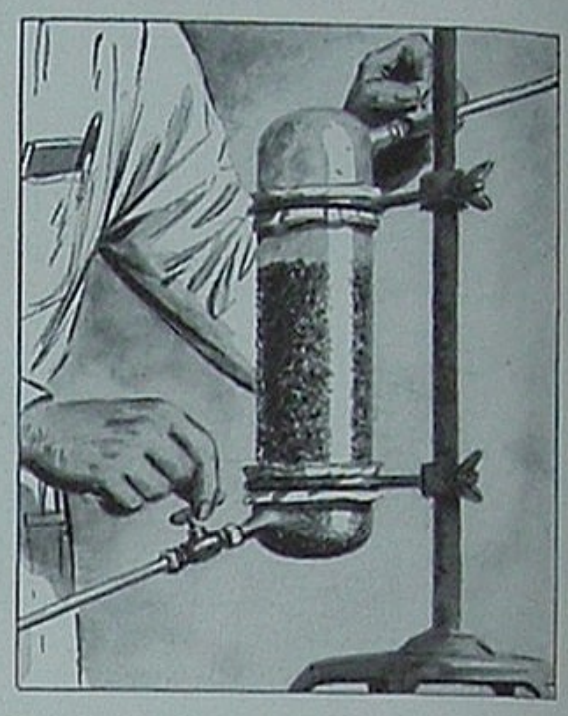
Armstrong, Edward J., Oleum Ref. Mfg.
Moriyama, Harold T., Honolulu Dist.
Patrick, John T., Oleum Refinery Mfg.
Reid, James W., Oleum Refinery Mfg.
Snyder, George B., L. A. Refinery Mfg.
Stark, Grover C. Jr., Southwest Terr.

You gain — We profit

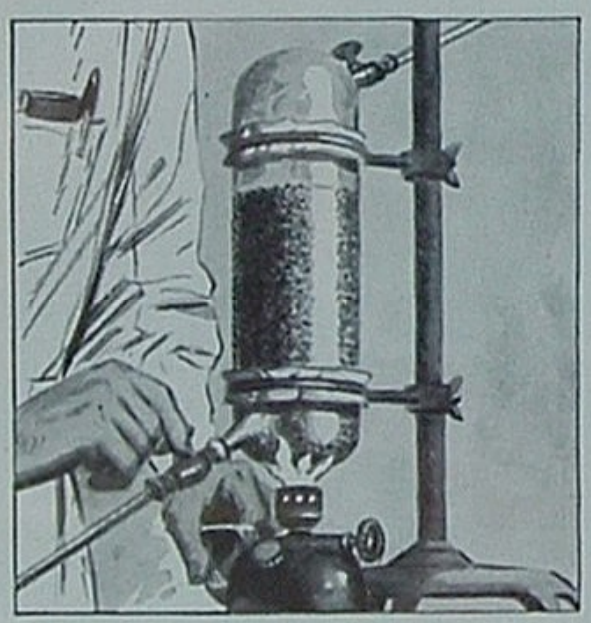
1. Everyone who read the magazines and newspapers during the war is familiar with the fact that you can make such things as rubber, plastics, nylon and a long list of products from butadiene, ethylene and other petroleum gases. But one factor that has kept many of these synthetic products off the peacetime market has been the cost of obtaining the pure gases.



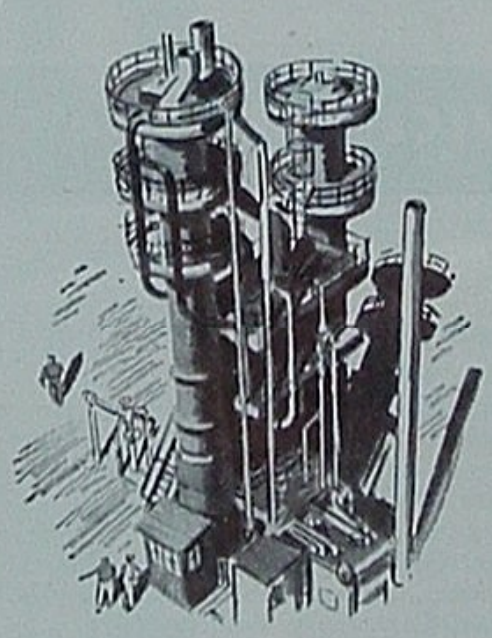
2. All of these gases can be made by cracking natural gas and many are present in refinery gases. But in both cases they're mixed with other gases, and it's been costly to *separate* them. You can cool the mixture down until all the gases are liquid and then distill them off one by one. But this is expensive. Or you can separate them by a process called absorption.



3. For it has long been known that if you pass a mixture of gases through a bed of charcoal, the heaviest gas will be absorbed while the others pass on through. But this absorption process isn't very economical either. First, as the charcoal becomes more and more loaded up with the gas it is absorbing, it is able to extract less and less as the gases go through.



4. Second, in order to extract the gas that *has* been absorbed by the charcoal, you have to shut the unit down, heat the charcoal to drive off the captured gas, cool off the charcoal afterward and start over again. So, in trying to develop a continuous, *economic* process that would take advantage of this absorption principle, Union Oil research men hit on an ingenious method of passing moving gas through *moving* charcoal. It did the trick.



5. The result is a Union Oil patented process called *Hypersorption* which is not only economical but highly efficient. Two of our *Hypersorption Units* are already in commercial operation under license to chemical companies, several more are being negotiated and we're building a big one ourselves. Those units will make the manufacture of synthetics economical enough to be of use to you.

6. To our way of thinking, this *Hypersorption Unit* is a perfect example of how a free competitive economy benefits everyone. Because of the *profit opportunity* presented by this situation, we had the *incentive* to keep exploring it until we solved the problem. And because we solved the problem a number of products that people buy every day are going to be more plentiful and less expensive than they've ever been before.

UNION OIL COMPANY

OF CALIFORNIA

INCORPORATED IN CALIFORNIA, OCTOBER 17, 1890

This series, sponsored by the people of Union Oil Company, is dedicated to a discussion of how and why American business functions. We hope you'll feel free to send in any suggestions or criticisms you have to offer. Write: The President, Union Oil Company, Union Oil Building, Los Angeles 14, California.