MARCH 1951

"On Tour"

ON TOUR

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MARCH 1951

In This Issue

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ON TOUR is published monthly by Union Oil Company of California for the purpose of keeping Union Oil people informed regarding their company's plans and operations. Reader participation is invited. Address communications to ON TOUR, 617 West 7th Street, Los Angeles 14, California.

A Washington Ping

OUR occasional criticism of the Federal Government is always intended as constructive criticism. Basically it is self-criticism, because any mistake on the part of those in high public office reflects directly upon the voters who placed them there, or upon others of us who failed to elect more capable officials.

Accordingly, may we now condemn ourselves for the tetra-ethyl lead muddle into which the national capitol is preparing to flounder?

Some 370 million pounds of tetra-ethyl lead is required annually to provide U. S. civilians with satisfactory anti-knock gasoline. Military aviation is currently using an additional 50 million pounds. However, Federal stockpilers want an extra 24 million pounds set aside during the next six months, which amount can come only from the civilian quota.

The solution of the problem seems obvious. Why not cut all oil companies back a uniform 12½ per cent or so of their normal civilian tetra-ethyl lead requirements, and divert that amount to Government stockpiles? Then each oil company would be free to use its reduced supply to the best advantage, or perhaps through research devise other ways of maintaining high gasoline quality.

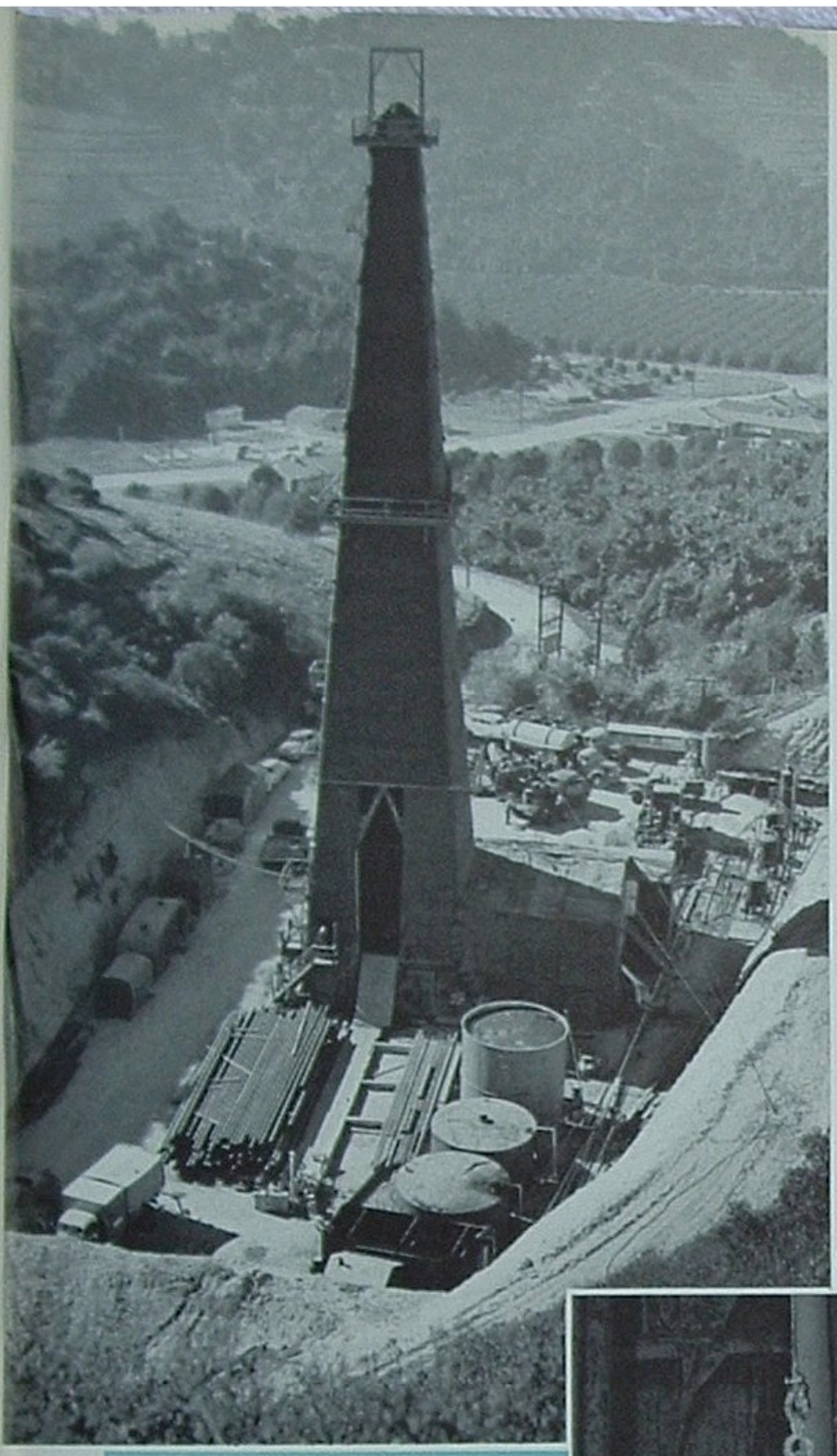
No, Washington wants it done the Washington way. Our bureaucrats have become so used to ceilings that they want a ceiling placed on the octane rating of gasoline. They suggest an 86 premium grade and an 84 regular grade.

We don't see how they could police such a regulation without placing a staff of government inspectors at each refinery to test every blend of gasoline, or an agent at each service station to determine who may buy the premium grade.

But we do see how the proposal could add thousands of names to Federal payrolls, destroy competition between companies, discourage research, prevent gasoline improvements, promote Socialism—and probably save no tetra-ethyl lead whatsoever.

ATTENTION EMPLOYEE SHAREHOLDERS

The Annual Shareholders' Meeting is scheduled for April 10th. If you do not plan to attend this meeting personally, please sign and return the proxy that has been mailed to you. A two-thirds vote is required, and no employee should regard his or her holdings as being too small for representation at this meeting.



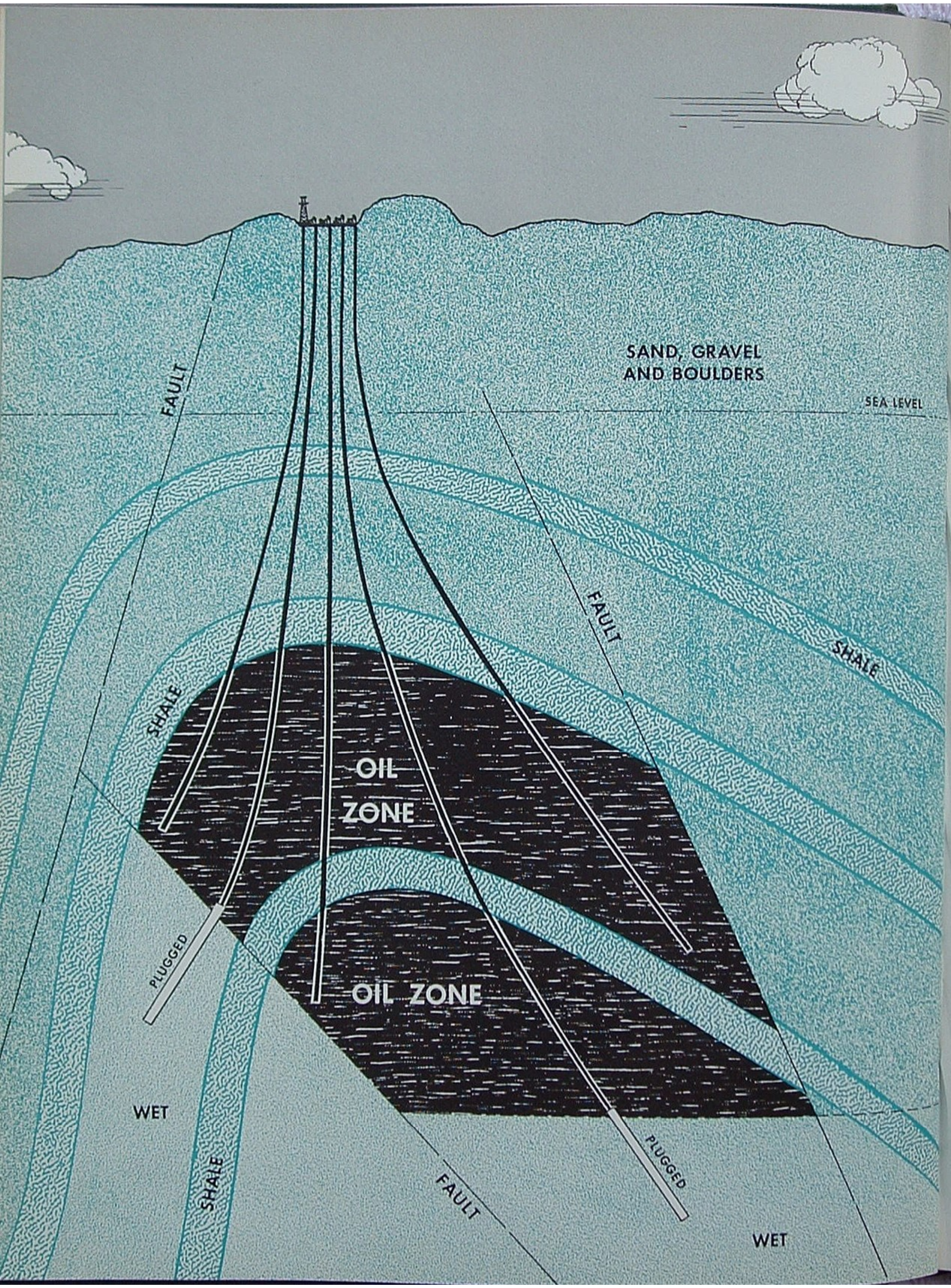
THE WHIPSTOCK

SOME YEARS AGO, when a workable survey instrument came into being, it was discovered that rotary drilled oil wells seldom went straight down. The straightest of them usually followed a spiraling course. Others veered away from hard formations and took the crooked path of least resistance. Some undoubtedly departed so far from the perpendicular as to miss the oil sand entirely or, in rare cases, tap someone else's pool.

Disquieting as this discovery appeared to be, drilling engineers characteristically put it to immediate use. If drill pipe could stand the strain of turning in such crooked holes, they reasoned, why not purposely drill at an angle? That would permit bypassing tools hopelessly stuck a thousand feet underground. Or drillers on some beach might bottom a well hundreds of yards offshore.

The tool they devised to achieve such results was the whipstock—so called evidently because it resembled the dashboard receptacle where oil men used to anchor their buggy whips. It consisted of a cylindrical steel casting, some 12 feet in length, with an inclined groove for turning the drilling bit about two degrees off its vertical course.

From the above location east of Whittier, the Company is drilling a dozen oil wells via the whipstock method. Roughnecks Floyd Williamson, Chuck Revell and John Carmichael, right, are disconnecting a bit and reamer, after which the whipstock, extreme right, will serve to turn a bit from perpendicular.


SAND, GRAVEL
AND BOULDERS
SEA LEVEL
FAULT
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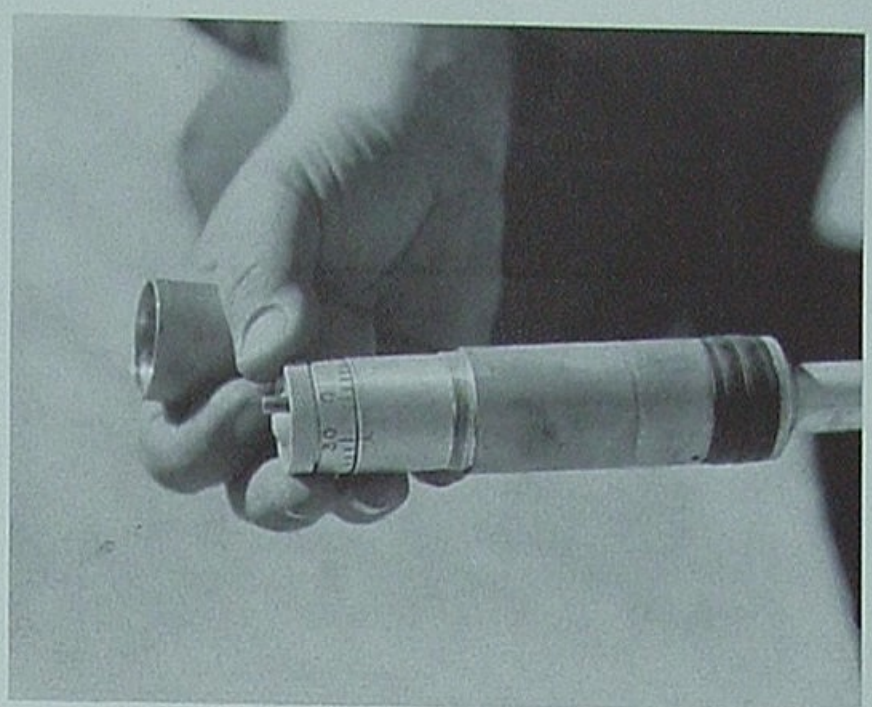
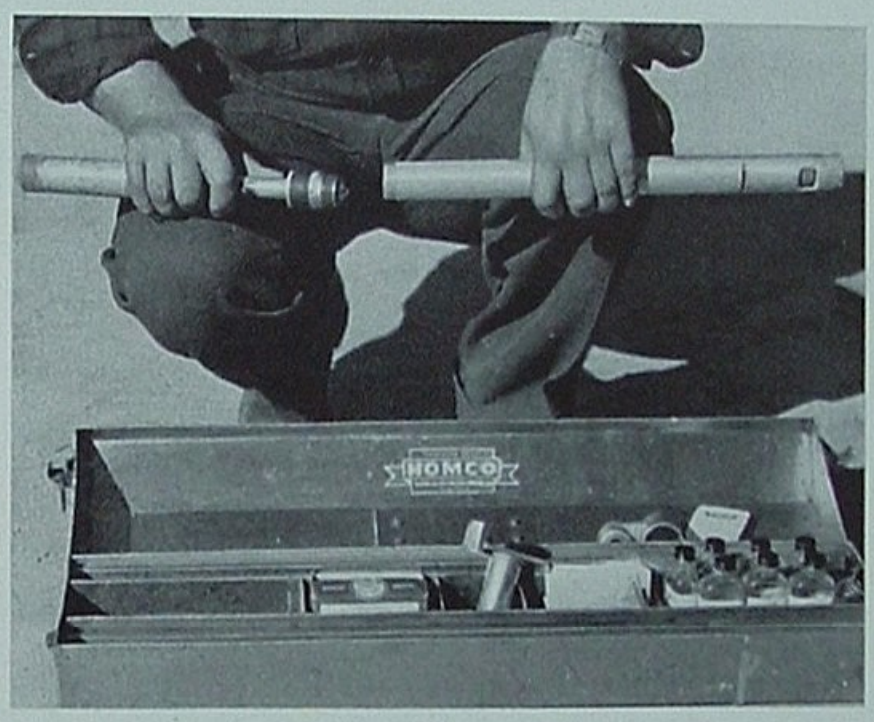
Pusher P. J. Thayer explains the "inclinometer" by showing the slot where unexposed film is inserted . . . . . .



and setting a timing device to trip the camera shutter exactly 30 minutes later . . . . . .



. . . . . and connecting a flashlamp to provide light, and finally loading the device to make a compass reading.

At first the whipstocks were permanently cemented in place underground. Later, better results and less trouble were encountered by using removable whipstocks. Cylindrical at the top, these can be slipped over an end of drill pipe and kept from slipping off by next connecting the bit. Then bit, whipstock and drill pipe are lowered together.

A chisel point on the whipstock's lower end helps it gain a firm bite on the well bottom and remain facing in the desired direction. Further application of weight from above shears a bolt holding bit and whipstock together, and the bit starts rotating downward. Guided by the whipstock, the bit enlarges one side of the original hole and continues at this angle to make from 10 to 20 feet of "rat hole" beneath the whipstock. On being withdrawn, the bit again engages the bell-shaped top of the whipstock and lifts it to the surface.

After the whipstock has been removed, normal drilling procedures are resumed. Drill pipe, equipped with a larger bit and reamer, follows the direction of the "rat hole" and starts a great circular turn toward oil sand. Wells have been drilled successfully at angles up to 65 degrees.

Directional drilling isn't quite as simple as we have tried to describe it. There's a trick for instance in lowering a whipstock hundreds of feet down a hole and making sure that it is wedged to face say north instead of some other direction. Also, exceptional skill is required to determine the exact angle being followed and to correct any unscheduled deviations.

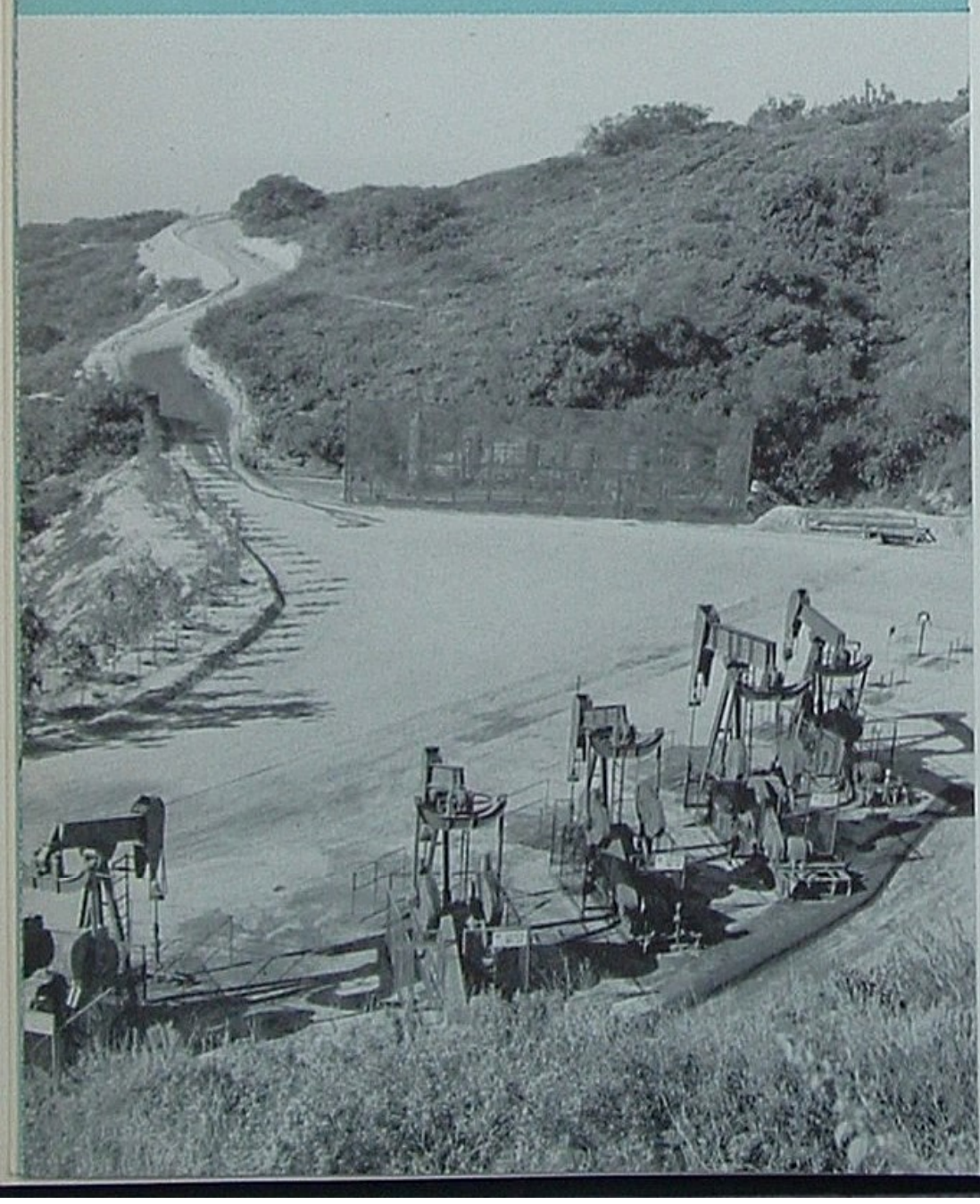
An instrument that makes such control possible is the "inclinometer," shown on these pages. Actually, it con-

At left is a factual cross-section showing how wells drilled from a small surface location are taping a much more extensive oil zone under La Habra Heights.

The completed wells, some flowing but most being pumped, present a not uninteresting view to nearby residents.

Veteran Union Oilers Erwin Price and Milt Varner examine remote controls, which govern well during an emergency.

Most field equipment here is hidden by hills, rows of trees and lattice fences. Company roads are kept dust free.



sists of four instruments—a timer, a flashlamp, a camera and a compass—all intricately coordinated. When lowered inside of a Monel-metal collar to the desired well depth, this instrument records the compass reading on film. By taking similar readings at various depths, engineers can plot the hole's direction and location.

Whipstock drilling is proving valuable today in the La Habra Heights area near Whittier, where the Company is developing oil rights purchased more than 40 years ago. In order not to disturb residents who have built homes there in recent years, the Field Department has limited its drilling operations to a minimum of drill sites, all as well concealed by hills as possible. At each location, as many as 15 wells are being drilled, their surface locations being only a few feet apart but their bottoms often extending laterally from the drilling site a quarter of a mile or more.

These wells are averaging about 4500 feet in depth. Each is drilled in about three weeks, after which the rig, with its heavy machinery and some 50 tons of drill pipe, is skidded forward a few feet and put to work on the next hole—all in the short space of 12 hours. The rig is equipped with a soundproof covering, described in the May, 1949, issue of ON TOUR, which successfully prevents noises from disturbing anyone's sleep.

Leaning over backwards to preserve good neighborly relations, the Company has even gone into oil field landscaping. Pumping units are painted green to blend with surrounding shrubs and orchards. Lines of trees have been planted and lattice fences erected to hide some of the equipment. Sprinkling systems have been installed to keep everything around the wells green and free from the hazard of brush fires.

One neighbor who had watched the oil men plant a row of trees to hide pumping units from his front-porch view later asked that the trees be removed. It intrigued him to watch a dozen pumping units silently bending to their labors long after sundown.

Trading floor of the New York Stock Exchange—

Photo courtesy of Press Association, Inc.

How to Become a Capitalist

"WELL, how do you like being married to an oil man?" That was Jim's greeting to his wife as he wound up another day of well-pulling.

Madge, who had been thinking of that very subject while she sat waiting in the car, was prepared with a good answer: "I'd like it a lot better if you owned some of those oil wells." She smiled when she said it, but her remark contained an unmistakable note of sincerity.

So, as the young couple sped homeward, the subject of ownership was not permitted to die. Jim agreed that nothing was too good for the wife of a well-puller. If Madge wanted an oil well, he'd buy her one. In fact, he'd buy her a thousand oil wells scattered from Canada to the Gulf. Besides, he'd throw in a few hundred miles of pipe line, several tank ships, dozens of gas plants and refineries, hundreds of trucks and marketing stations.

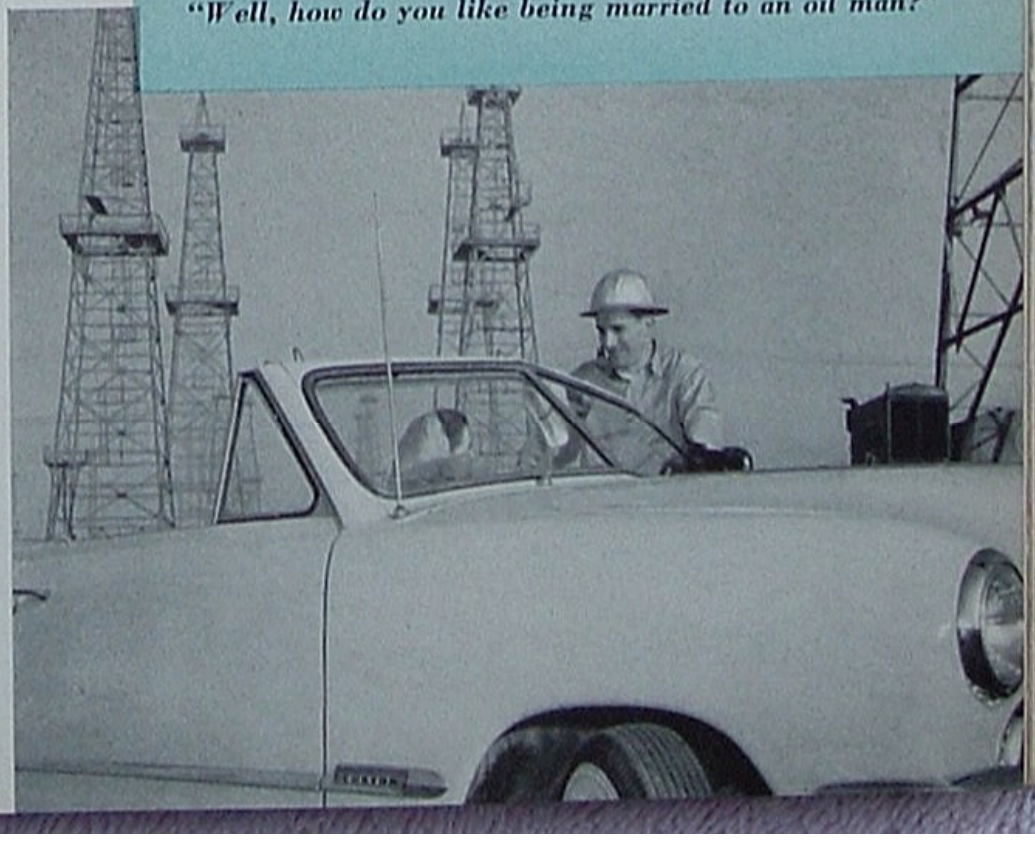
Madge contributed a few mansions, limousines and fur coats to the conversation, but mostly sat back and marveled at her husband's exuberance. Normally, Jim wasn't the day-dreaming type—even for the fun of it.

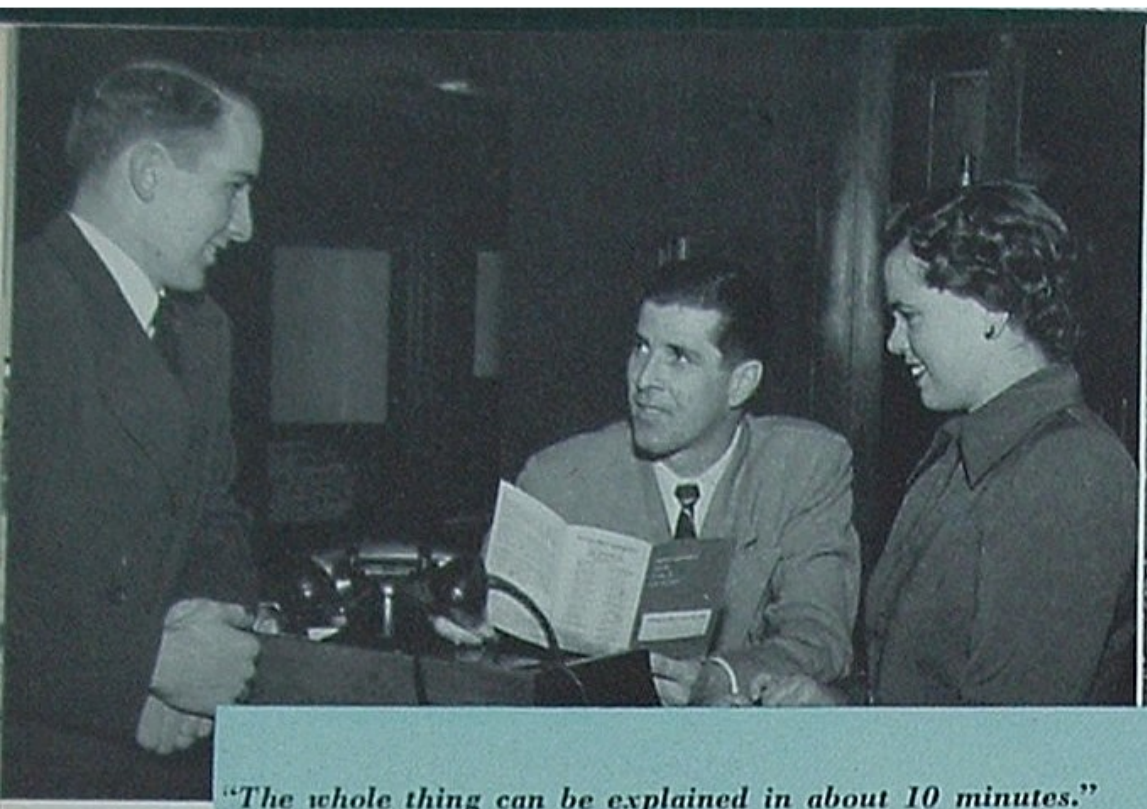
As it turned out, however, Jim had something more than dreams in mind. On his next day off, it was he who suggested going to town on a shopping tour. And, rather than stopping at their usual parking lot, he drove to one on Spring Street, in the midst of banks and brokers' offices. Before Madge had gotten a satisfactory answer to her "What on earth are you up to?" they had entered a doorway marked DEAN WITTER & COMPANY —INVESTMENT BANKERS, and Jim was asking a girl at the information desk several questions about buying stocks. A moment later they were standing before the desk of Ed Ziegler, the first salesman of stocks either had ever confronted.

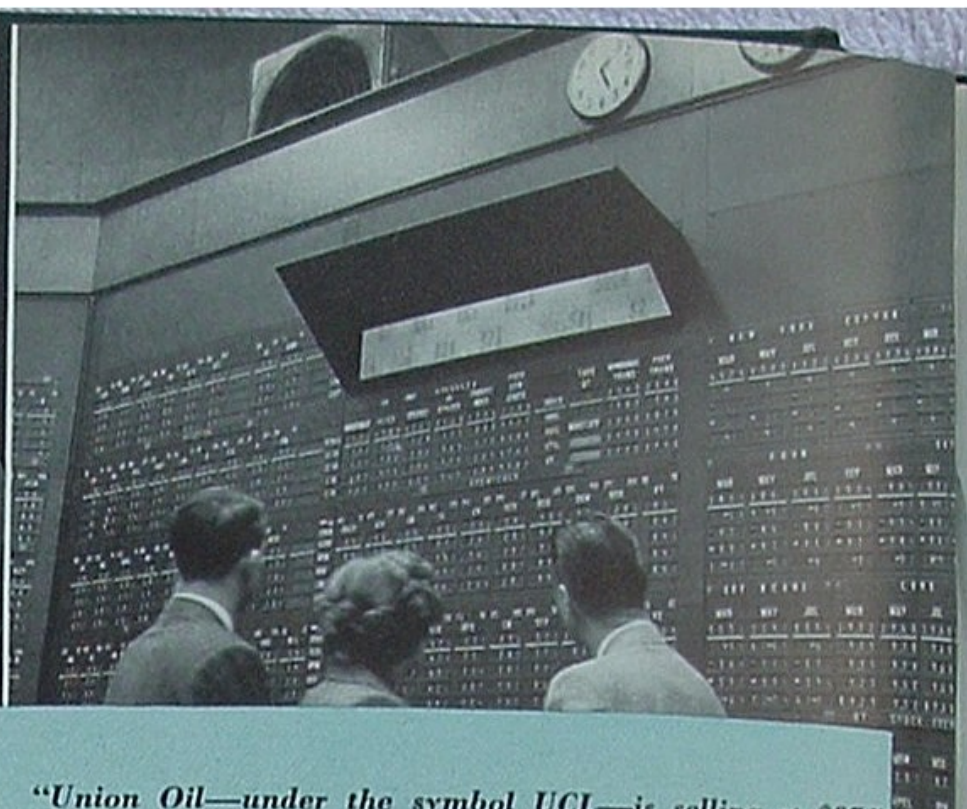
It seemed to be an exceptionally busy office, so Jim wasted no time in getting down to business. "Mr. Ziegler," he began frankly, "I guess you'd describe us as rank amateurs in the stock market. It's the first time we ever stepped inside of a broker's office. But my wife here wants me to own some of the oil wells I've been working on for several years, and I figured this was the place to come. How do I go about buying a piece of the company I work for—Union Oil Company?"

"Well, that's a fairly easy question," Ed smiled. "How many round lots of Union Oil would you like to buy at today's market?"

"Well, how do you like being married to an oil man?"







"The whole thing can be explained in about 10 minutes." *"Union Oil—under the symbol UCL—is selling at $37."*

Jim looked a little puzzled. "The first thing you'll have to do," he finally confessed, "is teach me the language. 'Round lots' sound a little foreign to me. Would you have the time to explain this whole setup? Or is it too complicated?"

"Not complicated at all compared with the oil business," Ed replied. "In fact, the whole thing can be explained from A to Z in about 10 minutes, and I'll gladly help if you'd care to listen. Where shall we start?"

"Might as well start with A," Jim suggested. "Remember we're beginners. Tell me, what's the difference between stocks and bonds?"

SECURITIES

"Bonds are evidence of indebtedness of the corporation. They pay a fixed rate of interest and often are backed by a mortgage on some of the physical property of the corporation. When you buy bonds, you are lending your money to the corporation. Such interest bearing certificates are a sort of promisory note—a promise to pay.

"There are two general kinds of stocks—*common* and *preferred*. Preferred stock is usually limited in the extent to which it can participate in profits but has a prior claim on dividends. Your purchase of common stock, on the other hand, means that you are an owner to the extent of your participation—10 shares, 100 shares, or 1000 shares—of the unmortgaged assets of the corporation. Usually the holders of common stock may participate to an unlimited extent in the corporation's profits after prior charges have been met."

"Then the holder of common stock comes nearer to being a real owner?"

"Generally, yes. He has voting rights in the corporation. In a bad business year, he may have to forego dividends; but in a good year he may make a much larger profit than the holder of bonds or preferred shares. Also, common stocks are more inclined to fluctuate in value in accordance with the corporation's success or failure, or with economic changes."

BUYING

"I'm sure its common stock we're most interested in," Jim remarked. "Now, how do we go about buying it?"

"Securities can be acquired by two different methods, depending on your choice," Ed replied. "First, you may wish to pay in full for the securities you buy. This is a purchase for cash. Ordinarily you deposit an amount of money with our cashier which will approximate the cost of your stock purchase. When the stock is actually purchased, we will notify you and make any necessary adjustment.

"Upon completion of the money part of the transaction we will, upon your instructions, give you the stock certificate as we have received it; have the corporation transfer the certificate to your name and then give it to you; or hold it for your further instructions.

"The other general type of account is the *margin* account. In this case, under the Federal Reserve Board requirements, you must deposit in cash with us a substantial part of the purchase price of the stock. We then purchase the stock for you by supplying the balance of the required funds ourselves, charging you interest on those funds. We would keep the certificate as security for the funds we advance. Nevertheless, any dividends would be credited to your account or paid to you.

"If you already own securities which have a listed market, you can deposit them with us instead of cash in

an amount sufficient to meet the requirements of the Federal Reserve Board. We would then supply the full amount of cash necessary to purchase the additional securities you have decided to buy.

"If you subsequently sold the stock, we of course would deduct the amount you owed us at the time and the balance would be yours for other purchases or withdrawals, whatever your choice.

"Let's take the stock of your own company as an example. Suppose you want to buy 100 shares. On today's market Union Oil—which appears on ticker tapes and exchange boards under the symbol UCL—is selling at about $37 a share. You then, if this were a cash transaction, would deposit approximately $3700 with us.

"Prices of most securities, including Union Oil, are printed daily in many newspapers. Just turn to the financial page and you can check the price of any security in which you are interested. Prices are continuously reported to us from New York and other large cities where stock exchanges are located. You will notice that prices ordinarily are shown in ⅛ of a dollar variations, or 12½ cents. So, a ticker tape reading 'UCL—37⅛' means Union Oil stock is selling at $37.12½.

"There are two chief types of orders, namely *market* orders and *limited* orders. If in your case you had specified to us that you wanted to purchase the stock at the best price immediately available, that would have been a market order. Our representative on the floor of the New York Stock Exchange would have gone to the point on the floor where all orders to buy and sell Union Oil stock are assembled. If for example 37 was being *bid* for the stock and 37⅛ being *asked*, he would have purchased it for you at the lowest *asked* price, $37.12½ a share.

"On the other hand, had you specified a price limit of $37, the order would not be filled until there was someone willing to sell at or below your limit. If, however, you had specified $37.25 we would still have bought it for you at $37.12½, the best price available under your limit.

"There are other types of orders of course. For example, you can limit your order as to the time as well as price. If you had specified $37 for your Union Oil, you could have limited the order to a day, a week, a month or any specified time."

ODD LOTS

"Very interesting!" Jim interrupted, "but how about us beginners who can't afford a hundred shares?"

"You're very important," Ed replied, "because the stockholders of most of our American corporations own on the average less than 100 shares. I used that figure because it is a *round lot*—the normal unit of trading used to expedite transactions on the stock exchange.

"You can, however, purchase or sell any smaller number of shares from 1 through 99. These are called *odd lots* and, as a matter of fact, represent a substantial part of all business transacted on the stock exchanges. These odd lots are bought from or sold to a member of the stock exchange who is called an odd-lot dealer. He acts as a principal and we, as your agents, buy from or sell to him ⅛, or 12½ cents, away from the price of the next 100 share transaction made on the exchange. This 12½ cents is the odd-lot dealer's commission.

"For example, you want to buy 10 shares of Union Oil. We receive your market order and send it to the odd-lot dealer. The next 100 share transaction is at $37.12½. The odd-lot dealer sells it to you through us at $37.25. Or, if you were selling, he would buy it from you at $37.

"Finally, we mustn't ignore the fact that investment bankers, ourselves for instance, must live too. Our commission on transactions of less than $100 is 6 per cent, the minimum being $6. On transactions from $100 to $1000, we charge 1 percent plus $5. Between $1000 and $4000, the commission drops to ½ per cent plus $10. Over $4000 it is 1/10 per cent plus $26."

"I think we're in about the 20 share class," Jim suggested. We have a little less than $1000 salted away for a rainy day. What would 20 shares cost us including commissions?"

"Well, 20 shares of Union Oil at $37," Ed figured, "comes to $740. The odd-lot dealer's commission at 12½ cents a share will be $2.50. Our commission on the transaction will be about $10. In other words, for a total of about $752.50 you can become a 20-share owner of Union Oil Company in about five minutes."

"Not really five minutes?" Madge inquired.

"Really," Ed replied. "Through our modern wire facilities it is possible for us to take your order, transmit it to our representative in New York, have him buy the stock through an odd-lot dealer, and receive a confirming reply—all in less than one minute. I believe corporation ownership can change hands faster and less expensively than any other type of ownership."

STOCK EXCHANGE

"That's amazing!" Madge exclaimed. "And now may I ask another question?—What happens in the stock exchange? And why do you buy the stock in New York?"

"Good questions," Ed answered, "because too many persons are misinformed about stock exchanges.

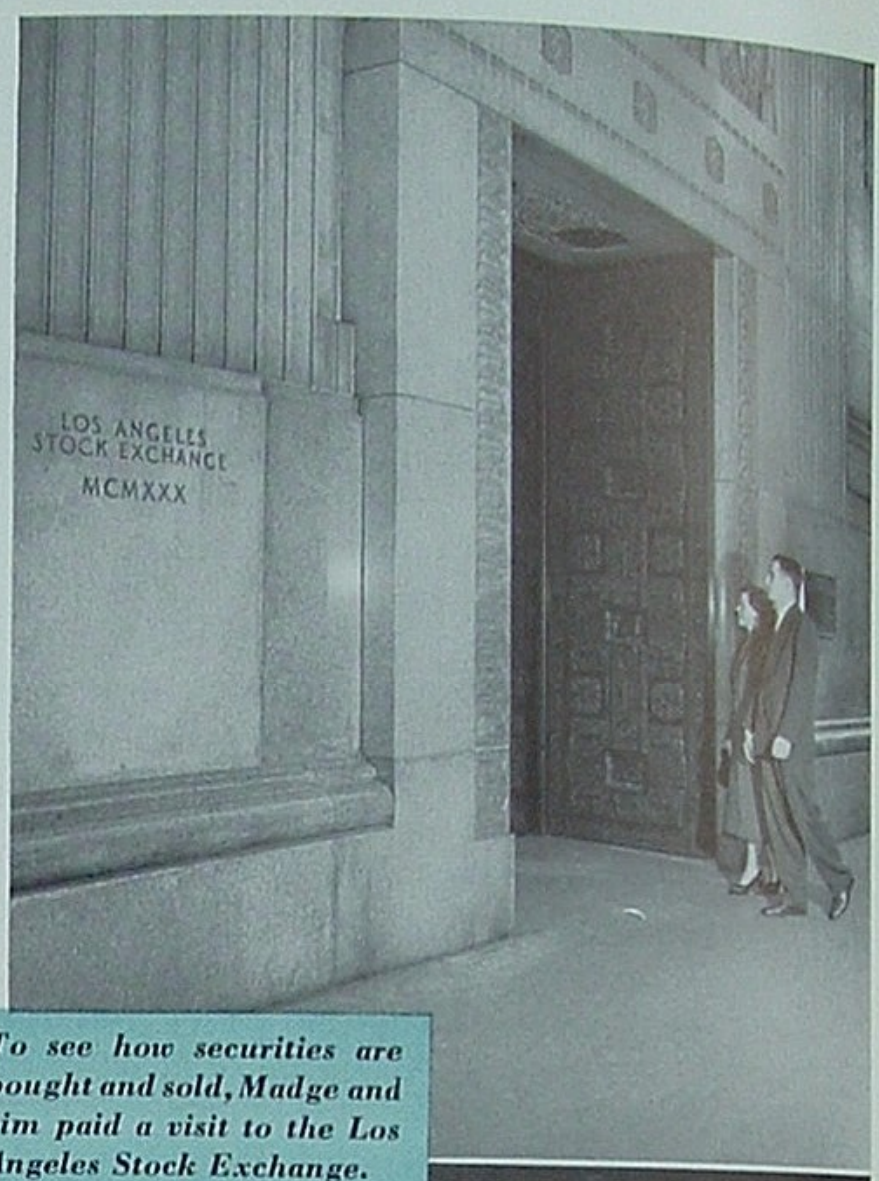
"Actually, over 1400 successful American business enterprises have securities listed on the New York Stock Exchange alone. This Exchange came into existence in 1792 when the First Congress created the need for a market place for Revolutionary War Bonds. Savings banks, insurance companies and individuals with free

capital to invest were springing up in the East. New York's location made it the natural financial center of the country. And as time went on, and the facilities of the Exchange expanded, it became the natural market for out-of-town capital seeking investment.

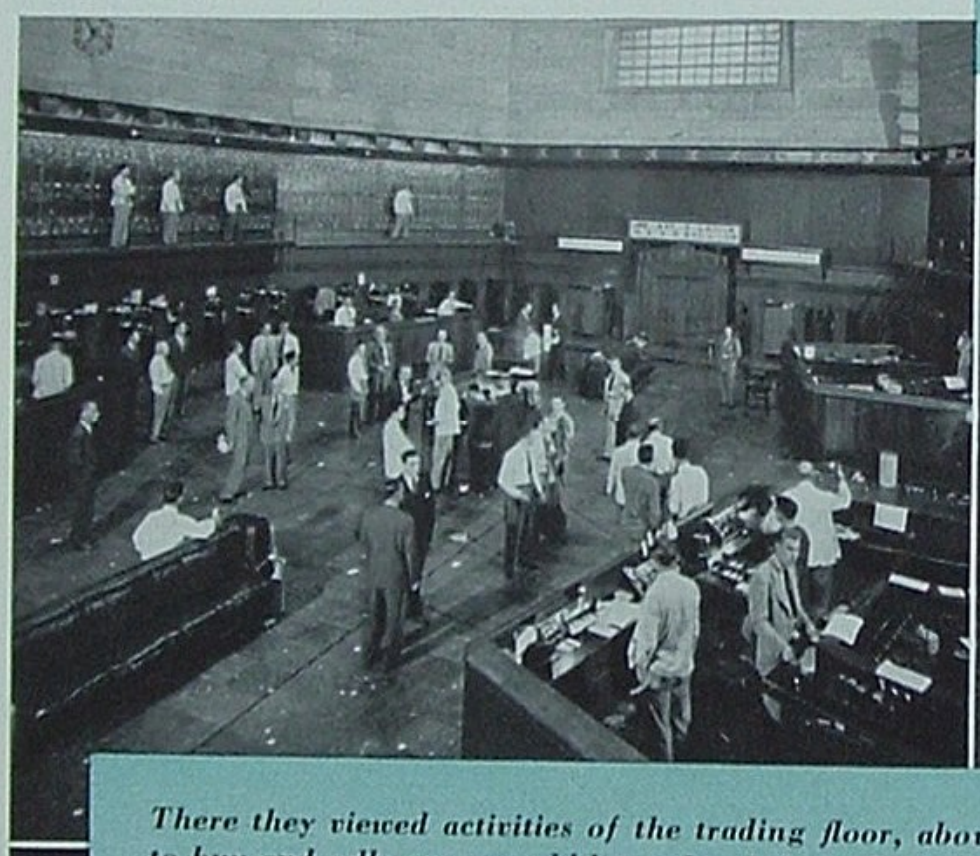
Most of the transactions on the New York Stock Exchange at present, however, do not originate in New York. The majority come from other communities. They originate in the nation-wide offices of more than 600 member firms like our own.

"Of course, similar transactions take place in other stock exchanges also, of which there are 19 registered in the United States. In the West we have one in Spokane, one in Salt Lake City, two in San Francisco, and one right next door here in Los Angeles. The New York Stock Exchange is merely the biggest.

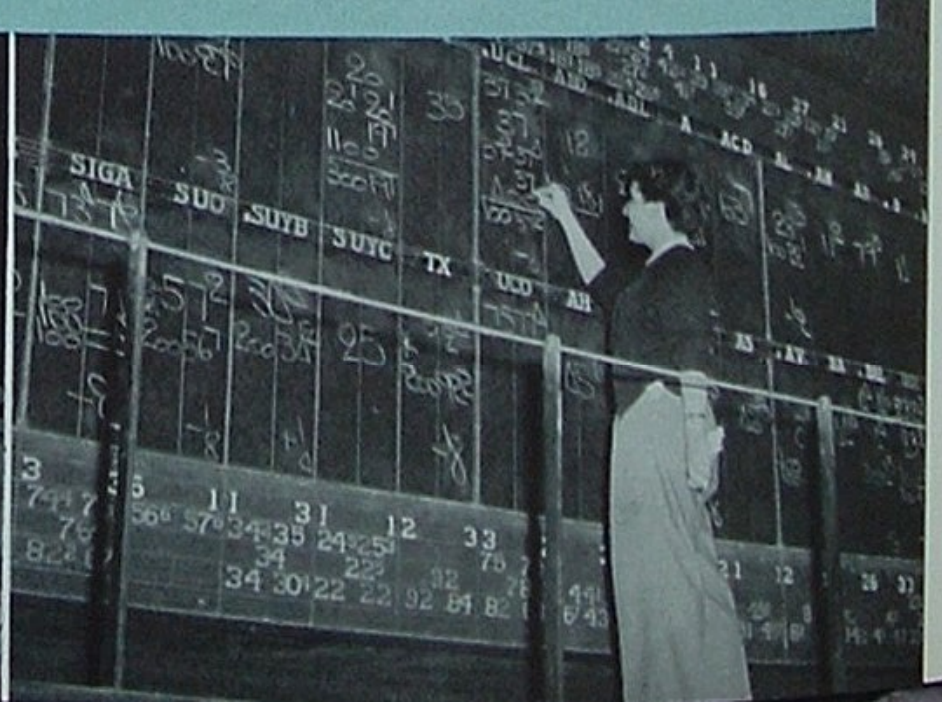
"The important thing to know is that a stock exchange does not buy or sell securities, nor does it fix prices. It merely provides the facilities where member brokers or dealers get together and do the buying and selling for millions of American stockholders. Another stock ex-



To see how securities are bought and sold, Madge and Jim paid a visit to the Los Angeles Stock Exchange.



There they viewed activities of the trading floor, above; saw how a broker's representative receives orders to buy and sell; saw an odd-lot order, below, clocked and filled; and witnessed the posting of a UCL sale.



change function is to report prices that are established by the buyers and sellers.

"You have seen auctions where the auctioneer offers a piece of furniture, some cattle, or some other article for sale and asks for bids. That is similar to the way markets in securities are conducted. It is naturally a more highly organized procedure than small auctions, but the principle is the same. The buyer making the highest bid buys and the seller with the lowest offer sells when the two agree on price. Bids and offers are made so that they can be heard. After one sale is completed, bids and offers start all over again. No secret transactions are allowed. Prices are given immediate publicity through the stock ticker.

"The existence of stock exchanges provides securities with marketability. Investors who know that there is a market place for their securities are more willing to invest than if there were not places of such a nature. This in turn makes it easier to raise the funds for gigantic industrial enterprises that have helped the nation to become so powerful economically.

"Corporations listing their securities on the New York Stock Exchange are required to issue statements showing their financial position and periodic reports of their earnings. The earnings statements usually are issued quarterly. Publicity given to the financial activities of these concerns is of immense help to investors.

"Orders are executed on the Exchange only by a member of that exchange, who oftentimes bids a large sum for his membership. A broker who is not a member but receives an order for execution on the Exchange must therefore arrange to have it handled by a member.

"Your broker performs many services in handling your account. In addition to opening your account and executing your orders, there are such tasks as safekeeping your cash and securities, assisting you in the exercise of rights and proxies, the collection of coupons and dividends, and so on. There is also the service of rendering statistical and economic information."

Jim felt that he needed little statistical advice about his own company. He had a good general knowledge of Union Oil's wide-spread operations. He knew the oil fields intimately. The skilled men that he worked with every day impressed him so favorably that he was glad to count many of them among his best firiends. He used Company products and knew that many of his neighbors were customers of long standing. Union Oil's long and useful existence, its fine reputation among business concerns, its steady earning record, its continued growth and success—all of these things added up to a sound investment. Accordingly, his purchase of the 20 shares was quickly consummated.

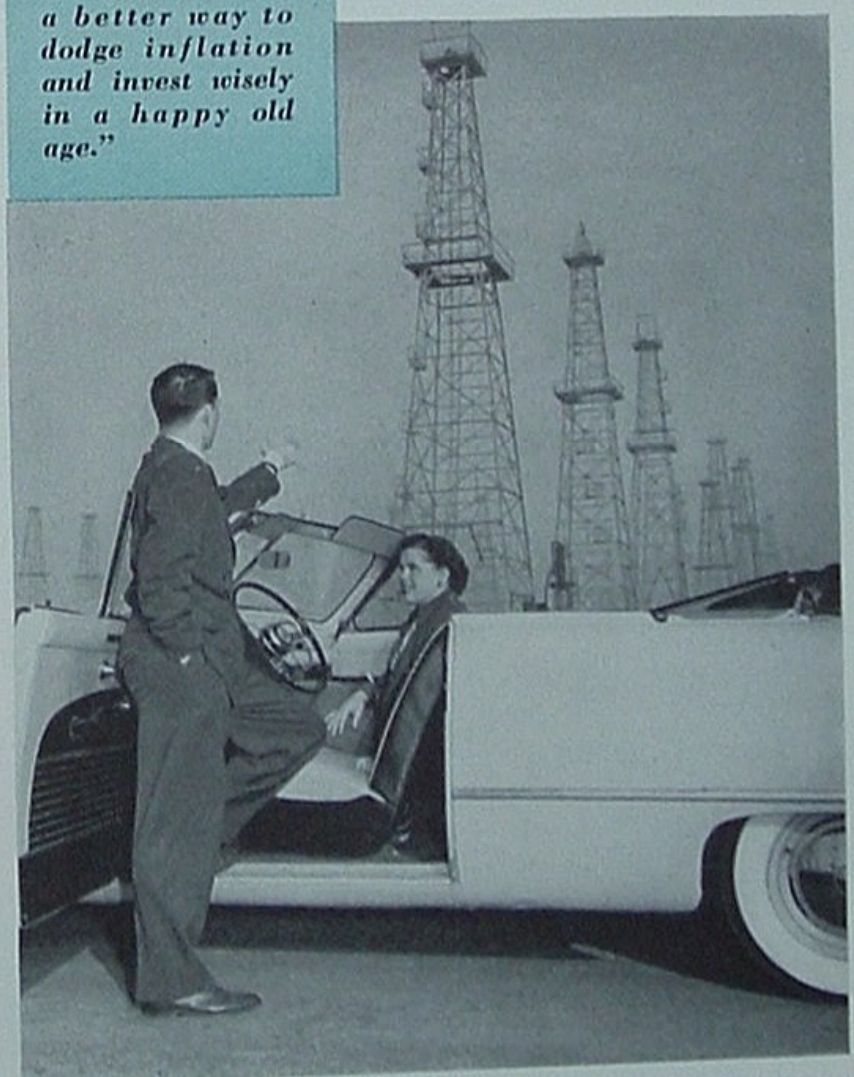
But it was not until late that afternoon that Madge understood the importance of Jim's adventure in capitalism. Her husband drove home by way of Dominguez. Stopping amid towering derricks, he stepped out for the first time on his own oil property and delivered a short speech:

"There you are, lady, oil wells—dozens of 'em, but just a few of the several thousand we own. Maybe we'll get only a drop out of each barrel, but drop by drop it'll add up to a nice big pool by the time we retire.

"Bet you can't guess how much we'd save by buying just one share of stock a month until I reach my 40th service anniversary. If the prices of stocks stay where they are today, we'll own nearly $18,000 worth of the Company, not counting our dividends received. The income alone from that much stock should be around $1000 a year. I don't know of a better way to dodge inflation and invest wisely in a happy old age.

"And another thing, it won't seem half so tough crawling out of bed in the morning, knowing I'm coming out here to operate my own business.—Now how do you like being married to an oil man?"

"I don't know of a better way to dodge inflation and invest wisely in a happy old age."



CAST OF CHARACTERS

Madge	Imelda Daniels
Jim	Robert Daniels
Salesman	Edward Ziegler

Dorothy Abbott kept all eyes in the vicinity of the ball at least.

Roger Clark, one of the capable speakers, found himself appointed district sales manager, Medford, following a convincing road performance. Right, Jerry Lamb and Ray Chapman, property men, did a valiant job keeping the ball equipped with new scenery.

At the Biltmore Hotel in Los Angeles, both the Line and

Biggest Ad Yar

THAT it pays even to advertise advertising was evidenced by the enthusiasm that greeted our 1951 sales and advertising meetings. Close to 10 thousand Union Oilers, including both dealers and employees, were on hand at 52 meetings held throughout the West. They dined well, enjoyed a quartette of topnotch professional entertainers, applauded dealers who were presented with handsome service plaques, and listened appreciatively to a fast-moving presentation of the Company's 1951 advertising plans.

To present the meetings this year required three separate traveling groups of speakers and entertainers. Although professionals were called upon to handle the musical and *cheesecake* assignments, the pith of all meetings depended upon home talent. And everybody,

both the Line and Manufacturing Departments feasted.

Yar Launched

from members of management who conducted the proceedings to salesmen orators who *carried the ball*, did a commendable job. After a few cases of first-night jitters had been calmed, the oil men seemed perfectly at home in their new spotlight environments.

Among employees who became star troupers and kept the show going to its successful conclusion were speakers Dudley Carter, Ralph Glass, Fred Olsness, Hart Miner, Roger Clark and Todd Franklin. Serving behind the scenes as property men were Karl Reynolds, John Newton, Ted Luke, Art Bryson, Jeremy Lamb and Ray Chapman. Territory Managers A. D. Gass, F. K. Cadwell and J. W. Miller took prominent part in the meetings, at each of which the local district sales manager capably served as master of ceremonies.

The ball looked nearly the same on both sides, thanks to Virginia Leith.

The presentation of service placques to dealers by President Reese H. Taylor was a feature of the initial performance at Bakersfield. At left, entertainers Francine Fay, Phyllis Inez and Phil Arden gave forth with a Cuban number that rated high-octane applause.

It was revealed at these meetings that Union Oil's 1951 advertising program, the most comprehensive in our history, will approximate 2¾ million dollars in cost. The popular institutional series will be continued nationally for its 8th consecutive year. The Ripley-type Triton ads will reach 50 million readers of Sunday papers. Billboards will continue to feature our quality products. Of the attractive new road maps being issued, six of the city maps will be in booklet form to lighten the former ordeal of street hunting. Already in the pockets of pleased customers are the new plastic credit cards and folders—first of their kind ever used. Newspapers and the radio will be used extensively for spot announcements and in instances where speed is the essence. In addition, direct mail campaigns and giveaways will be used to the greatest advantage in stimulating sales. Through one or more of these campaigns, it is estimated that every person who drives a car in the West will be influenced to try or depend to a greater degree upon Union Oil products and services.

The theme of our 1951 advertising meetings, "Keep your eye on the ball!" contains a recommendation for everyone to look beyond present discouraging world conditions to the normal peacetime opportunities that are bound to follow. Successful people and companies will be successful tomorrow for the same reasons they are successful today or were successful 20 years ago—through hard work, sound business principles, and staying on the job.

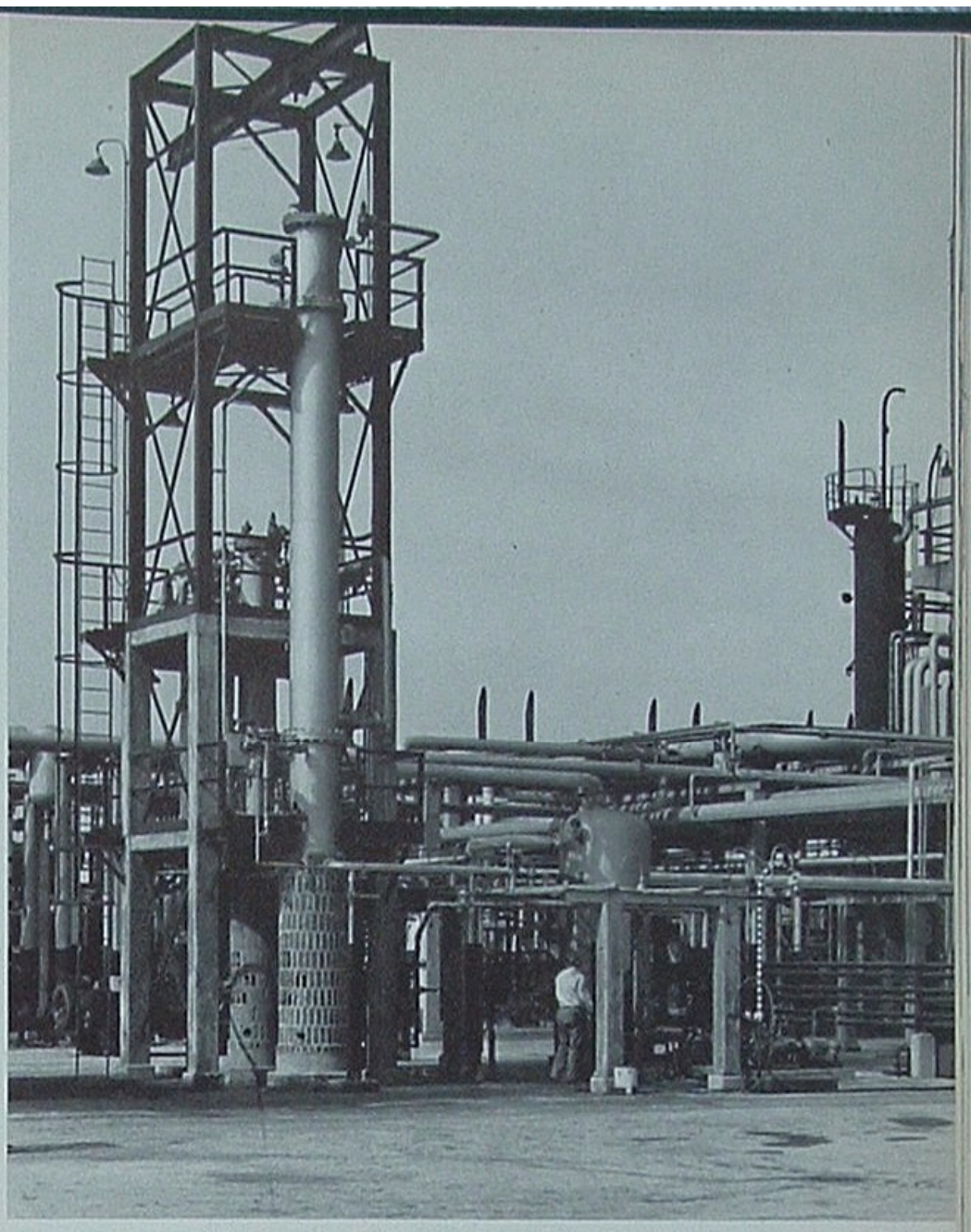
Seattle guests, above, were greeted by Territory Manager Ad Gass, center. The Northwest's troupe, below, included, from left, Jewel Eberle, Lea Jay, Gloria Grey; Ralph Glass, John Newton, Dudley Carter, Gordon Robinson, Carl Reynolds.

"76" Views of Refining

60. Waste Disposal

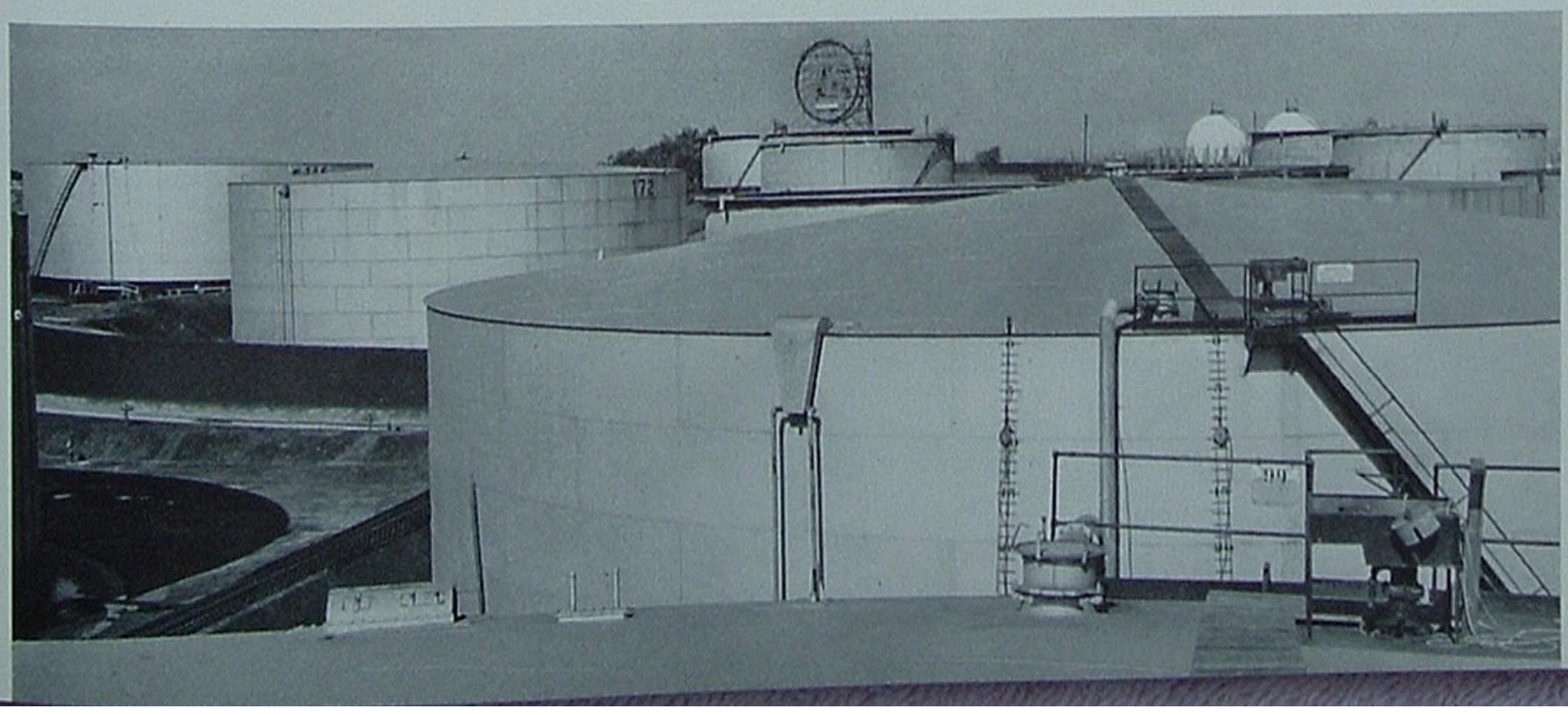
Even the troublesome impurities removed or produced during refining processes are not thrown away, but wherever feasible are preserved and put to use.

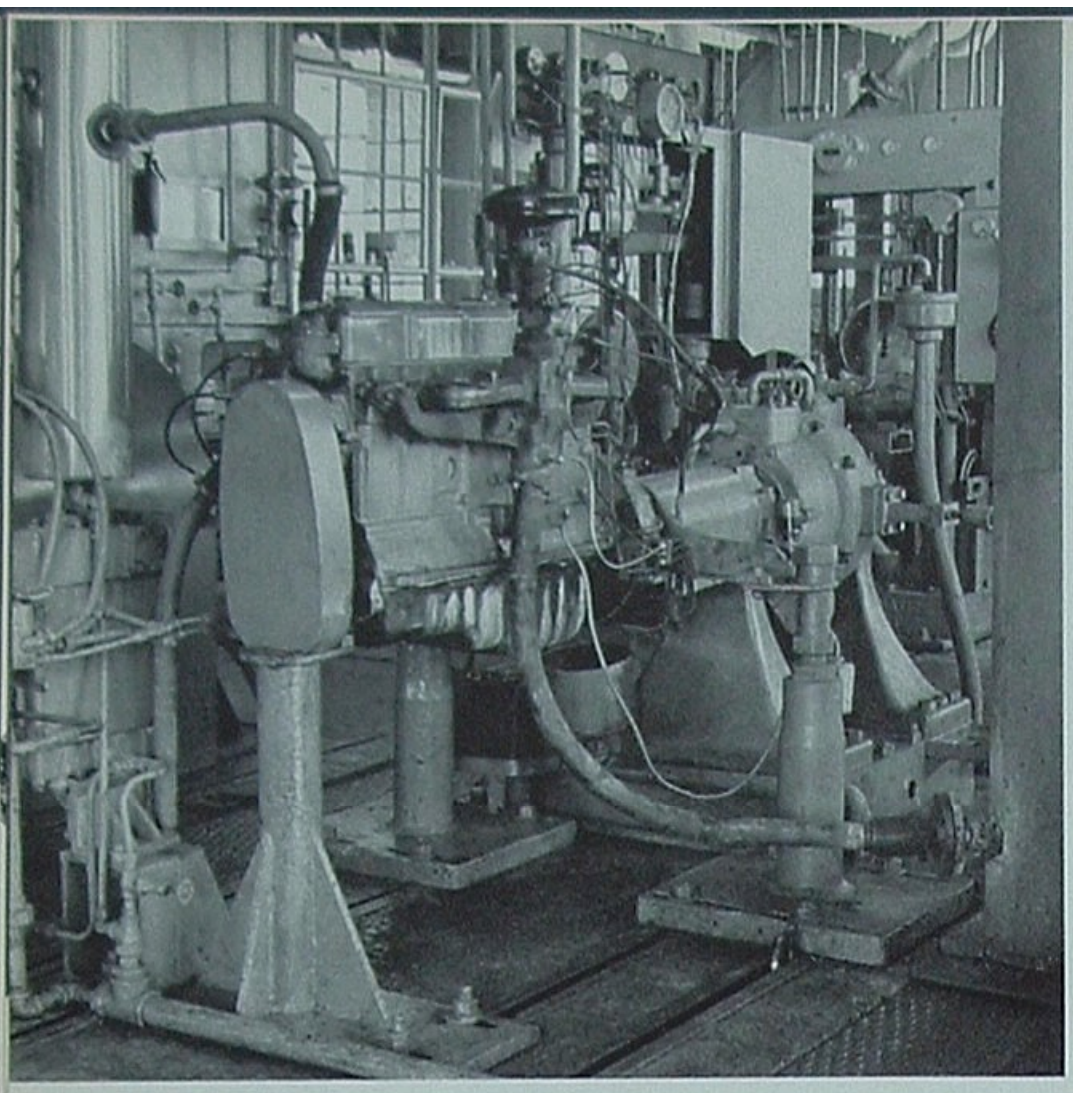
Refinery fuel gases, for example, contain quantities of hydrogen sulfide. Largely to prevent air polution, Los Angeles Refinery sends such fuel gases through an elaborate absorption process. Hydrogen sulfide is removed from the fuel gas and, in the installation shown at right, is re-absorbed by a solution known as MEA (monoethanolamine). The *enriched* MEA solution is then trucked to a chemical plant, where its hydrogen sulfide content is used to manufacture sulfuric acid. Much of the sulfuric acid eventually returns and is used in some of the refining processes we have previously discussed.



61. Gasoline Stocks

As a result of these many processes we at last have *gasoline*—but not the two or three varieties you are accustomed to buying in service stations. Rather, they are *gasoline stocks*, ranging from relatively slow-burning to highly volatile and explosive liquids. Remember that some are *natural* gasolines; that is, very little if any refining was required to improve on the product Nature produced. Others are *straight-run* gasolines, meaning they were produced simply by heating the crude and condensing its vaporized fractions. Also we have the *cracked* gasoline from our TCC Unit, and other *cracked* varieties from Unit 33. The butane-butene fraction has given us a synthesized gasoline called *light alkylate*. Some of the stocks are further separated into *light*, *medium* and *heavy* grades. All are stripped of objectionable impurities. They are stored separately in products tanks, below, holding up to 135,000 barrels each. Hardly any *gasoline stock* alone satisfies all requirements of a good motor fuel. But, thanks to their varied qualities, several can be blended in different ways to suit numerous requirements.





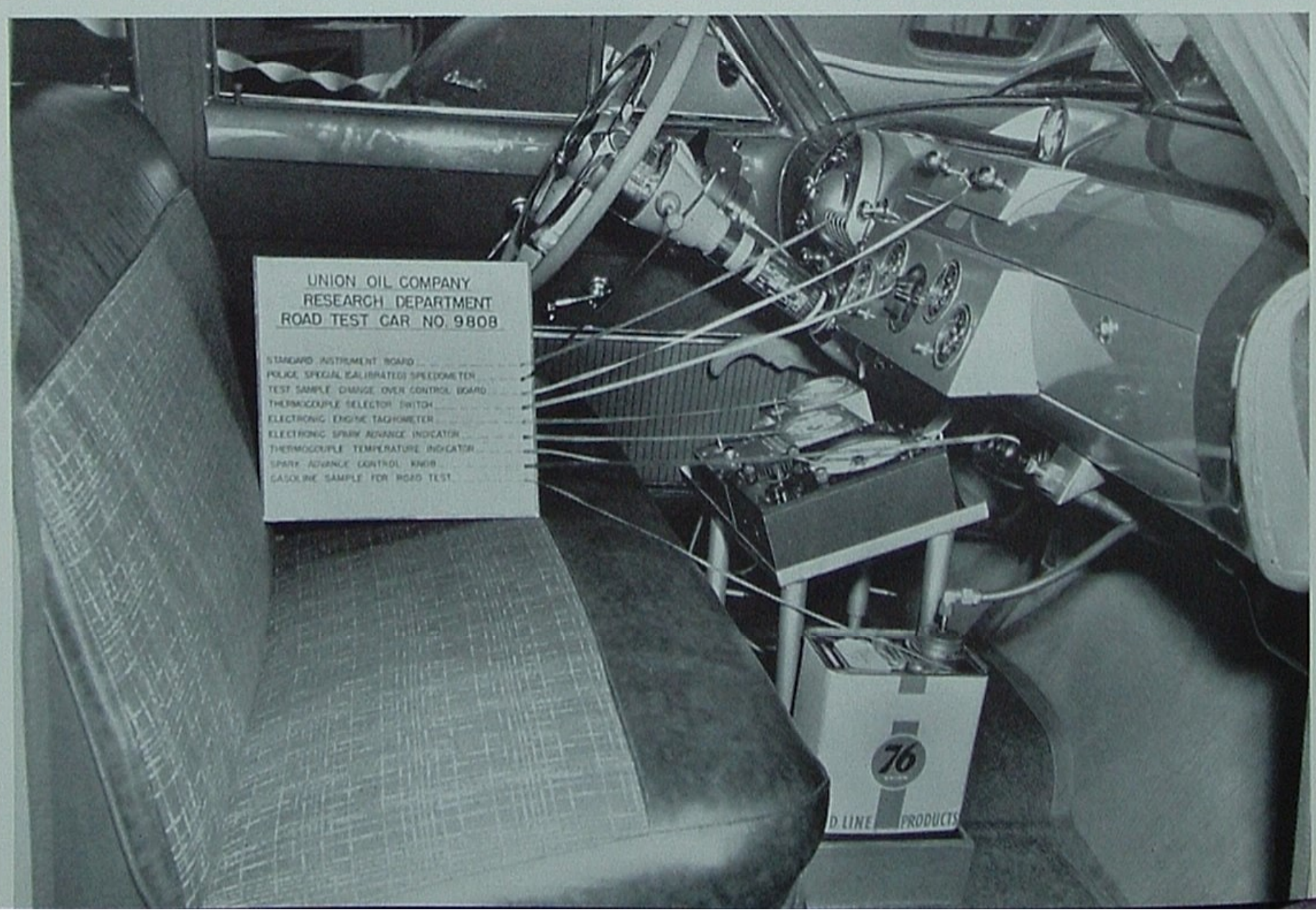
62. Engine Testing

is one of the means used to determine the performance qualities of gasolines. The fuels to be tested may be experimental blends of several gasoline stocks or samples of established gasolines that are being readied for market. All such tests are conducted by skilled research men.

The method usually consists of running some standard engine, such as the Chevrolet motor at left, for 100 or more hours, using the test gasoline for fuel. When the run is completed, the motor is taken apart and scientifically measured. Any deposits of gum and carbon are weighed and analyzed. Engine wear and deterioration are also scientifically measured. In this manner it can be determined whether a gasoline is efficient and generally suitable for the types of motors that will consume it.

63. Road Testing

is a necessary supplement to engine testing because some gasolines perform far differently on the road than in the laboratory, at high altitudes than at sea level, in summer than in winter. To overcome these variations, cars, such as the one below, are equipped with special fuel testing instruments and sent on long experimental runs. Using various blends of gasoline, they determine by actual road test the degree to which each blend will provide power, economy, quick starting and all other forms of driving satisfaction. Because of such painstaking precautions, modern Americans may drive through almost every extreme of weather, atmosphere and climate without giving thought to motor adjustments or changing their grade of gasoline. And the quality of motor fuel is steadily being improved.

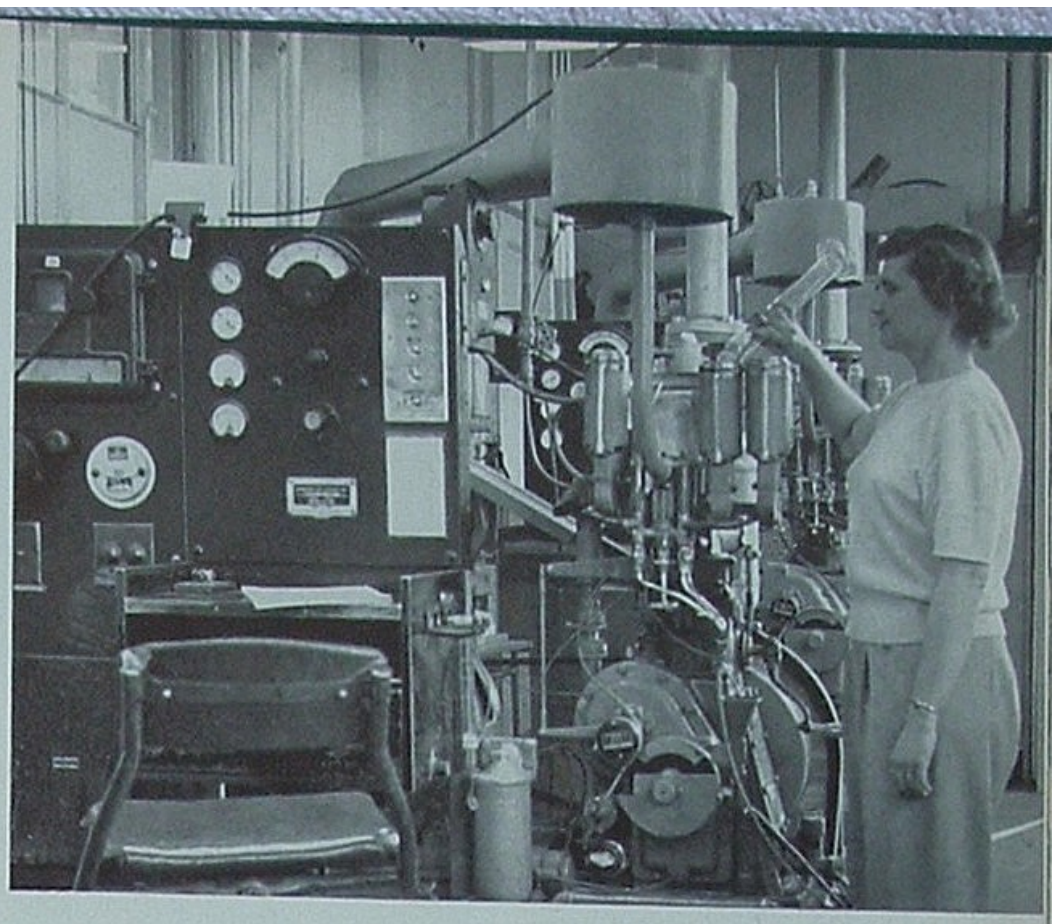


64. Knock Rating

The manner in which a gasoline burns in the cylinder head of a motor is important. If it explodes too swiftly or irregularly, some of its power is wasted and the motor protests with an audible compression *knock*. Better and quieter results are obtained if the gasoline burns with a slower and smoothly expanding flash. *Knocking* becomes an increasingly more serious problem as car manufacturers build fuel economy into motors by increasing compression ratios, or the pressure at which gasoline is ignited.

One of the poorest hydrocarbons from the standpoint of knock rating is normal-heptane, to which petroleum scientists have assigned a knock rating of 0. A much smoother burning substance is iso-octane, once considered to be at the top of the hydrocarbon scale and therefore given a knock rating of 100. The petroleum industry uses these two compounds as *reference* fuels and establishes the knock rating of a gasoline by comparing its performance with a mixture of normal-heptane and iso-octane.

To make certain that finished gasolines will equal or

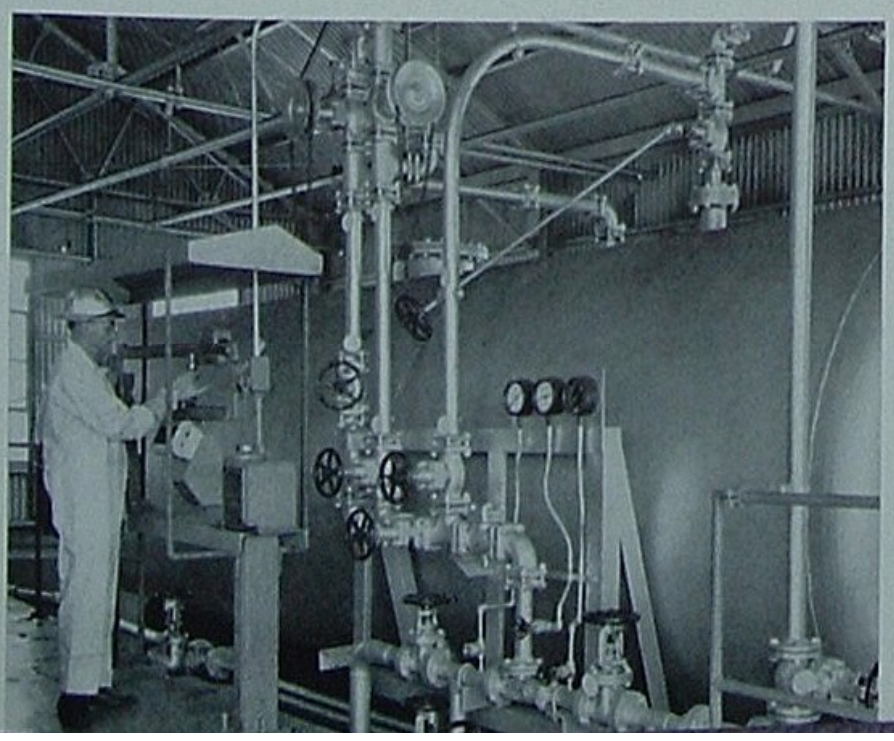


exceed anti-knock specifications, gasoline stocks are tested both before and after blending by means of such equipment as the fuel research engine above. These machines are far more sensitive to knock variations in gasolines than is any automobile.

65. Tetra-Ethyl Lead

One of the oddities of petroleum science is that small amounts of lead improve the octane number of most gasolines. Of course, lead as we commonly conceive of it in its metallic form does not answer the purpose. Rather, it is combined chemically with ethylene, a hydrocarbon, to produce a liquid compound known as tetra-ethyl lead. The maximum amount of this compound that can be used is only three milliliters per gallon, but such small amounts can improve the knock rating of most gasolines from one to several octane numbers.

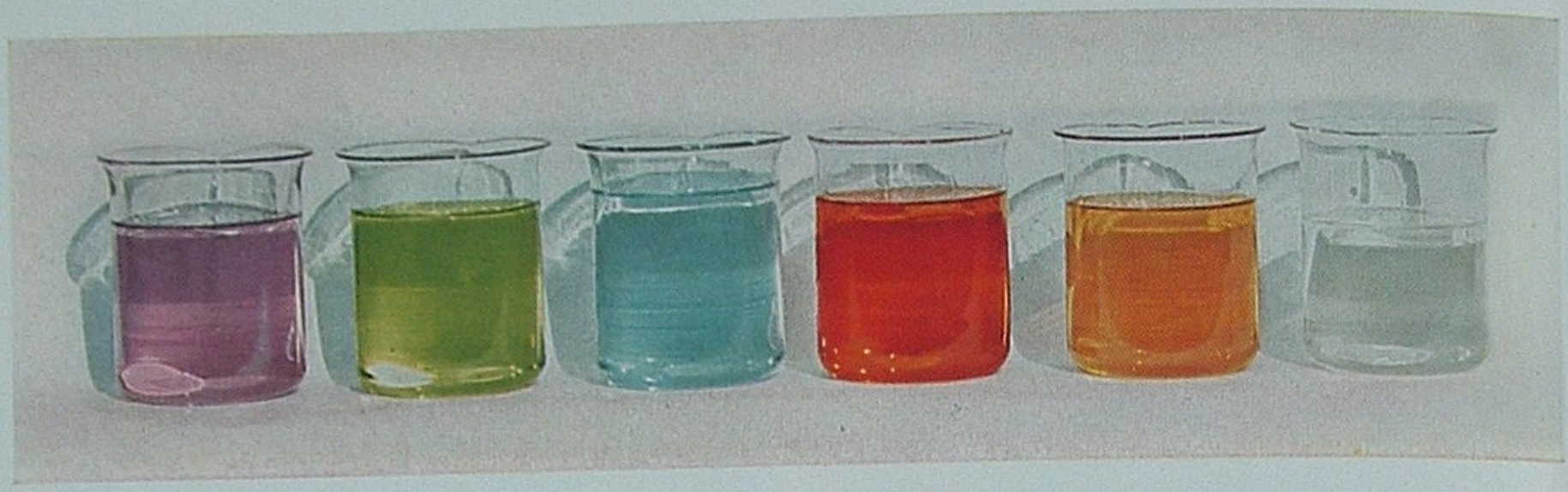
The tetra-ethyl lead storage tank below rests on a large weighing scale. When lead is ordered to bring a tank of gasoline up to refinery octane specifications, the operator responds by simply weighing out the quantity of compound required.



66. Inhibitors

Some gasolines, particularly the high-test varieties, are not as chemically stable as we'd like to have them. They are inclined to break up and combine with other substances at hand to form unwanted compounds. The most troublesome compounds thus produced are several varieties of gums which, if permitted to exist in motor fuel, might result in the fouling of carburetors, valves, piston rings, and so on. Therefore, petroleum scientists have had to devise ways of preventing any such harmful gasoline deterioration.

The shovelful of *di-tertiary butyl para cresol*, below, is one of three gum inhibitors currently being added to gasoline stocks. In minute quantities and in various combinations, these inhibitors are successful in preventing gum compounds from forming within the gasoline. The chemicals are usually added as soon as a vulnerable gasoline stock enters storage.



67. Gasoline Dyes

Last of the ingredients that are to comprise our finished gasolines are dyes. They are added solely for purposes of identification and safety. Employees, distributors and buyers of Union Oil products therefore would promptly identify the purple, green and blue samples above as 7600 Aviation Gasoline, Grades 115/145, 100/130 and 91/96 respectively; the red as 7600 Gasoline; the orange as 76 Gasoline. The white gasoline, containing no dye or lead, is used principally in appliances and motors that require no such additives.

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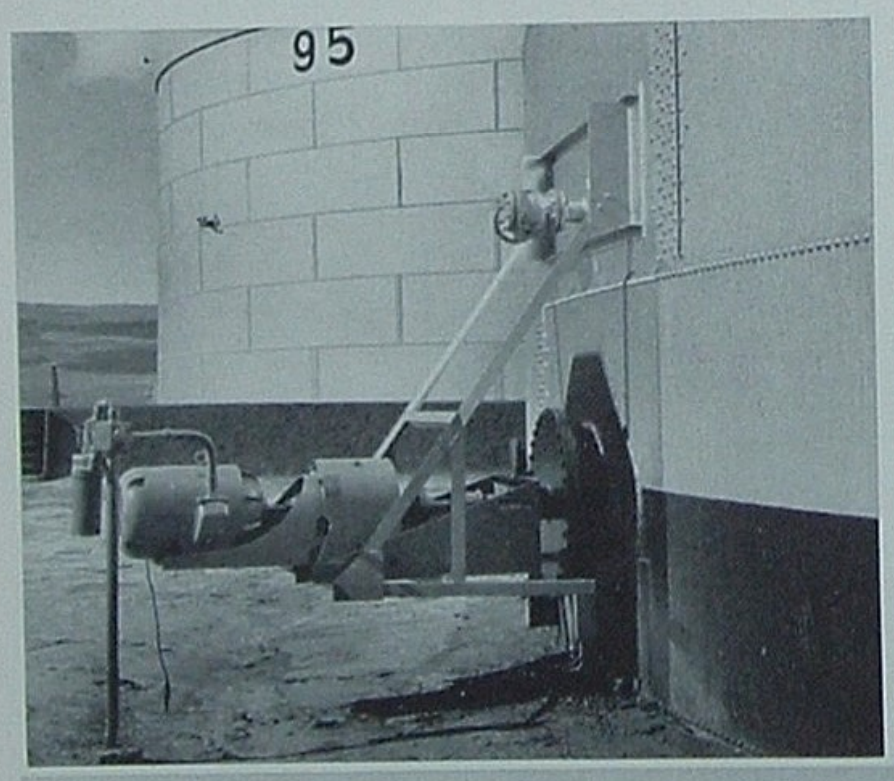
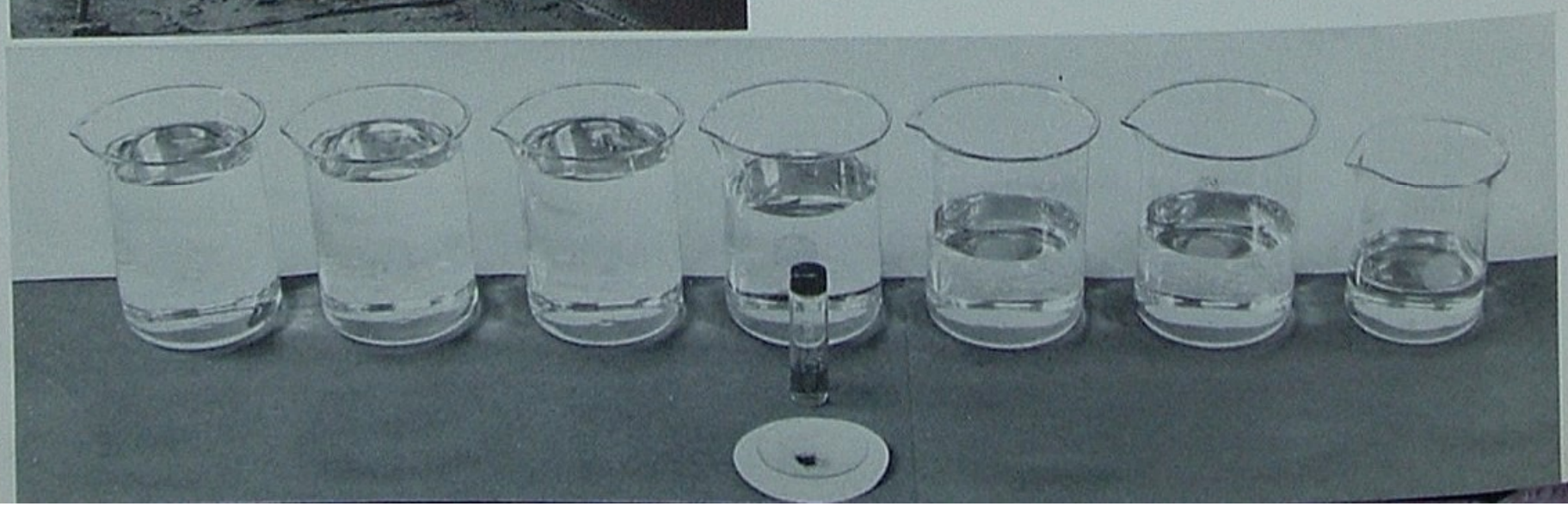
68. Gasoline Blending

takes place in a large tank whose identifying feature is an electrically driven shaft, below. This shaft turns a large impeller, which in turn keeps the gasoline ingredients circulating until all are thoroughly and uniformly mixed.

Typical of what it takes to make an excellent finished gasoline are the refinery stocks below, shown in their approximate blending proportions. From left, they include light TCC-cracked gasoline, 20 per cent; acid-treated medium-cracked gasoline, 20 per cent; natural gasoline, 20 per cent; medium straight-run gasoline, 15 per cent; light straight-run gasoline, 10 per cent; light alkylate, 10 per cent; and butane, 5 per cent. Add to these, 3 millileters of tetra-ethyl lead plus a few grains of inhibitors and dye and we have one gallon of 7600 Gasoline. Its exceptionally high anti-knock qualities are well ahead of the highest compression engines being developed today. It is quick-starting, powerful. It is dependable under all conditions of weather and climate. We believe it is the finest motor gasoline marketed in the world.

Other Union Oil Company gasolines are modifications of this 7600 ideal. 76 Gasoline, containing all of the foregoing stocks in slightly different proportions, exceeds the fuel requirements of most automobiles on the road and has been a leader on the Pacific Coast for many years. 7600 Aviation Gasolines are tailored to power every type of airplane from small private planes to the most modern combat aircraft.





INDUSTRIAL SUMMARY

INDUSTRIAL RELATIONS

Keeping abreast of recent improvements in first aid materials manufactured today, the Training and Safety Division, with the aid of the Company's medical director, E. Richmond Ware, M. D., after conducting an investigation has specified revisions in the Los Angeles Stationary Warehouse stock from which you requisition refills for Company first aid kits. While there are several improvements, two are important steps for protection of employees.

A new antiseptic solution, Zepharin Chloride tincture 1:100, will aid the treatment of wounds and lacerations. This antiseptic preparation is superior to the mercurial antiseptics now in use. In fact, when diluted 35 times it will destroy staphylococcus aureus microorganisms in less than 10 minutes while some other antiseptics will not kill them in 15 minutes when diluted only 5 times. In addition, it is non-irritating to the skin.

Like the passing of the "common drinking cup," the common eye cup is on its way out. The new Boric Acid Eye Wash package for removing foreign bodies from the eyes will include paper eye cups which are to be discarded after use. This will assure each individual that no contamination of the eye bath may cause an eye infection.

The new material will be supplied as the need for replenishing the first aid kits arises.

The General Wage Stabilization Regulation which froze wages, salaries and other compensation as of January 25, 1951, has now been modified by action of the Wage Stabilization Board.

Employers with previously established formalized Wage and Salary Administration Plans, such as developed and followed within our Company since 1935, will be permitted to make the individual wage and salary adjustments which are recognized as a normal and anticipated part of carrying on our operations.

In general we will be able to continue our past practice in respect to increases due to promotion and merit, and automatic length of service (time) increases.

Previous instructions with respect to salary administration procedures, modified where necessary to meet Stabilization Regulations, have been brought up to date and issued to department heads, personnel supervisors, and payroll offices.

from W. C. Stevenson

MARKETING

On January 15, Sales Promotion personnel were transferred from Head Office Sales Services to Advertising and Sales Promotion. This group will now report to Haines Finnell, director of Advertising and Public Relations.

Effective February 15, 1951, T. S. Ellis was transferred from Head Office Sales Services to be sales representative at Chicago, Illinois. Leo Miller, formerly at Bakersfield, transferred to Indianapolis as sales representative, effective February 1, 1951.

We are now marketing Royal Triton and Triton in the New York, Chicago, Hartford, Kansas City, St. Paul-Minneapolis, Houston, New Orleans and Indianapolis areas, the latter having been added recently. Plans are now in formulation for Boston, Buffalo, Philadelphia, Detroit and St. Louis areas.

Commencing the latter part of March, a specialized school will be conducted at Wilmington for industrial sales representatives. Basically this advanced school will deal with the application of our products as applied to all phases of industry. In addition to this program a series of meetings demonstrating the characteristics of our greases and their uses will be presented to the field in March.

On January 13 National Production Authority issued an amendment to its order M-4, prohibiting service station construction exceeding $5,000 in cost without first obtaining an NPA permit. The Company is filing applications to build on those sites where lease or purchase commitments have been made. NPA will favorably consider any hardship cases or applications for units which would aid in civilian defense.

from Roy Linden

• FIELD An exchange of assets has been made between the Union Oil Company of California and the Continental Oil Company which affects the Field Department's production of oil.

The Union Oil Company has owned non-operating interests in several fields in the Rocky Mountains as well as in the East Moss Lake Field in Calcasieu Parish, Louisiana, in which the Continental Oil Company were the operators. The crude oil, gas, and gasoline produced have previously been sold and Union's only benefit consisted of cash derived from the sale of these raw products. The exchange made with Continental, which became effective January 1, 1951, provides that the Company's assets in these properties in the Rocky Mountains and Louisiana be exchanged for a like value of Continental's holdings in the Kettleman North Dome Association at Kettleman Hills, California. By this means approximately 1,100 barrels daily of Kettleman 34 degree gravity crude and its associated gas and liquified products are added to our California refineries and will ultimately find their way, as refined products, to Company marketing outlets. An interesting result of this exchange is that the Union Oil Company, and its affiliates, now have 15.38 per cent interest in the Kettleman North Dome Association which makes the Company the third largest owner in K. N. D. A.

from Sam Grinsfelder

• MANUFACTURING As the first step in the refinery modernization program, construction has been started at Los Angeles Refinery on a 28,000 B/D Fluid Catalytic Cracking Unit. This unit will be integrated with the present Thermofor Catalytic Cracking Unit and completion is scheduled for about the middle of 1952. The main function of this unit is to produce high quality motor gasoline and additional aviation gasoline.

The rehabilitation of the isopentane production plant is in progress at Los Angeles Refinery. The production from this plant will indirectly increase the availability of 115/145 grade aviation gasoline by 300 B/D.

Crude oil and natural gasoline runs to stills during 1950 averaged 123,347 B/CD, or 45,022,000 barrels for the year.

from K. E. Kingman

• RESEARCH Ever since their adaptation, the standard laboratory knock rating procedures have required approximately one quart of gasoline in order to conduct the test. For refinery control purposes this, of course, has not been a problem but in many cases, particularly in research studies, it has been difficult or very expensive to furnish a quart sample. The Union Oil Company's Research Department has now developed a micro knock rating procedure which requires only one ounce of the material to be evaluated. Of particular interest is the fact that this procedure is more precise and the test can be performed more quickly than the standard method. Furthermore, existing knock test engines can be converted readily to the micro method. C. C. Moore of the Research Department presented a detailed discussion of the micro test before the February meeting of the American Society for Testing Materials.

The Korean situation and the Rearmament Program have brought about a large demand for petroleum products by the military services and in many cases new specifications for these products have been established. The Research Department has undertaken a major investigational program to develop and qualify these products which the Union Oil Company appears particularly suited to manufacture.

from C. E. Swift

• PURCHASING Continuing shortages of steel, chemicals, plastics and paper are resulting in higher prices, longer lead time and delays. In addition to this, Government directives, which actually restrict our use of certain items or compel us to use substitutes, are now being issued. The latest order to vitally affect our operations is the restriction on the use of tin cans for use in canning motor oils and greases. Purchasing is making arrangements to issue full information to all departments concerned as various orders are received. These various restrictions make it imperative that we use to the fullest extent all the items which are under directives, and which are becoming scarce.

The recently initiated program of reconditioning quarter barrels and thirty-five pound pails used for lubricating oils and greases is a good example of what can be done in the face of shortages and scarcities. These particular containers can, if necessary, be used over and over many times and it is anticipated that the reconditioning program will help materially in keeping our Sales Department supplied with the necessary containers.

We urge that all departments institute a program to eliminate waste, whether the item be gloves or welding rod or any other expendable supply.

from E. H. Weaver

• PIPE LINES Due to the shipment by U. S. Navy of Elk Hills crude of a lower gravity than provided for in our contract with the U. S. Army for handling this oil, it was necessary to install heating facilities at Buena Vista station. The Army will pay for installation of the heating facilities and the cost of heating the oil. These facilities were placed in opera-

tion in January and have increased the pumping rate substantially out of Buena Vista.

Our trunk line between Del Rey Station and Shell Oil Company's line at Manchester and Arizona Streets has been returned to service to move our Playa del Rey field production to Torrance through Shell's line. The contract covering the sale of this oil to Triangle Oil and Refining Company which has been in effect since 1948 was terminated in January.

• MARINE A contract was recently signed with the Bethlehem Sparrows Point Shipyard, Inc. for the construction of a new turbine-driven steel tankship of approximately 18,000 deadweight tons. This ship will have a slightly greater cargo capacity and higher speed than the three T-2 type tankers presently owned by the Company. Delivery of the ship is scheduled for January or February of 1952.

As a result of a seasonal scarcity of available tonnage to supply the armed forces, the Maritime Administration has announced the formation of a voluntary tanker pool to which owners of tankships have agreed to contribute tanker capacity necessary for the national defense.

As our part in the program we have been requested by the Military Sea Transportation Service to furnish transportation for one cargo from the Pacific Coast to Japan in early March.

from Ronald D. Gibbs

Organization Changes

Through action of the Board of Directors, on January 29, Alan J. Lowrey, assistant to the president, and K. E. Kingman, manager of Manufacturing, were elected vice presidents.

In the Exploration Department, Stanley G. Wissler was appointed research geologist for the Pacific Coast area, effective January 15.

The Production Department has announced the appointment, effective January 1, of F. R. Wade as division petroleum engineer for the Ventura Division. On February 9, Milan G. Arthur was appointed acting assistant chief petroleum engineer; he replaces E. C. Babson, who has gone to Washington, D.C., on loan to the Petroleum Administration for Defense, Production Division. On February 14, K. C. M. Anderson was appointed assistant to manager of Field operations, Pacific Coast Division.

Effective January 15, Sales Promotion was reorganized by Vice President A. C. Stewart. C. Haines Finnell, director advertising and public relations, was named to head also the department under Mr. Stewart. Reporting to Mr. Finnell will be F. T. Holt, Sales Promotion manager; W. M. Sopher, assistant Sales Promotion manager; Earl Welty, supervisor of press and public relations.

Central Territory has announced the appointments, effective February 1, of C. E. Rathbone as manager retail sales, and of John H. Fisher as district sales manager, Oakland.

Northwest Territory announced the appointment of R. M. Clark as district sales manager, Medford, effective February 5.

Pictures of the foregoing appointees are not being published in this issue of ON TOUR but will appear in a complete photographic organization chart now being prepared for publication in the near future.

"THE EGG AND WE"

is a title we can't resist for the photographic study at right, showing Distillation Foreman Coy Havely, Superintendent of Distillation Verne Taylor and Assistant Superintendent Jack Warnecke in conference over a collection of Oleum's "Dinosaur Eggs."

The eggs are actually lumps of coke hatched in one of Oleum Refinery's cracking units. They represent nearly all that is left from crude oil after modern refining equipment finishes its job of extracting gasoline and other valuable petroleum products.

But the exhibit is remarkable in a sense. It shows many of the various sizes of coke pellets produced, depending upon the types of crude being refined and the conditions used in cracking them. For want of a better name, someone dubbed the larger pellets "Dinosaur Eggs," which inept description still lingers on.

suggested by Oleum's "On Stream"

DESK AND DERRICK CLUB is the name of an organization recently formed among women working in the petroleum industry. Its purposes are to promote informative and educational programs of a type that will give its members a better understanding and appreciation of the industry they serve. Secondarily, it is a means of making women in different companies better acquainted.

Among Union Oilers who are active in this organization are, left to right above, (seated) Dorothy Harkness, Blanche Kelley, Caroline Lyons, Lea Keeler; (standing) Sylvia Sikes, Mary Prenevost, Annis Tully, Cleo Bean, Isabelle Hill, Marjorie Adams, Beatrice Parker, Florence Hicks, Marjorie Gleason, Miriam McKissick, Adelyn Cockrell, Eleanor Davidson.

This group, along with others who were absent when the picture was taken, have already won gratitude from the American Petroleum Institute. Working with the API reception committee recently in Los Angeles, these women met trains, staffed information booths and in countless other ways helped to make the convention a success.

JIM HASTINGS of Head Office Manufacturing is what you might call a constructive *doodler*. One of his latest contributions to the table linen was the drawing at right, which, when reproduced on paper and submitted to the National Safety Council, caught their appreciative eye. The drawing was reproduced without great change and will be displayed nationwide on Safety boards.

In my opinion ...

DEAR EDITOR:

On September 24 of last year the Oleum Refinery held its annual picnic and had the finest success ever attained in a project of this nature. . . . A written report and pictures were sent to you . . . but there has been no report in ON TOUR. . . . Why?

John R. Betts
Recreation Chairman

Dear John:

If ON TOUR were to publicize all of the social and recreational events arranged among Company employees, we'd have a full book every month of 60-day-old social news—at about $200 a page. If we publicized only the major events, others would have cause to feel neglected.

So, about two years ago, we began passing up even such Company-wide events as the annual golf tournament, the bowling tournament, and dozens of fancy barbecues. Employee hobbies, new babies, new cars, beautiful brides, and vacation trips were neglected. And nobody's caught a single fish since, according to our records.

Confidentially, Union Oil wants us to have fun and is usually glad to help organize a good outing. But the boss is a little sensitive about our "chewing the cud" of a picnic—at some $200 a page.

Today, ON TOUR is keeping within the limits of its title, which in a sense means on-duty. In a non-technical way it is trying to reflect the thought and feeling of a highly technical industry—how, where and why it operates; who keeps the machines running; how it is managed and coordinated; what it has achieved; and where it is going. ON TOUR is more interested in the skillful stillman, roustabout, salesman, foreman or engineer than in the best Company golfer or horseshoe pitcher. It aspires to be a convenient instrument of two-way communication, management to employees as well as employees to management. It wants to be fully and reliably informative about everything worthwhile that happens on the job.

Why? Because the whole future of our jobs our company and perhaps our country rests upon the extent to which factual information counteracts false propaganda.

If we're editorially *all wet* please toss in a towel.

The Editor

SERVICE BIRTHDAY AWARDS

MARCH, 1951

Forty Years

Ambrosier, Homer, Maltha Refinery Mfg.
Beck, John C., L. A. Refinery Mfg.

Thirty-five Years

Dunham, Orley R., So. Div. Field
Youngquist, Paul H., So. Div. Field

Thirty Years

Clark, John H. Jr., Central Territory
Cruise, Wm. H., So. Div. Field
Evans, Thomas J., So. Div. Field
Fenton, Roland R., H. O. Purch.
Myracle, Clarence C., So. Div. Field
Talley, Robert L., Coast Div. Field
Tessner, Norman H., So. Div. Field

Twenty-five Years

Adams, Fred B., So. Div. Field
Allen, Kenneth, So. Div. Field
Andrews, Allen W., Central Territory
Bernsten, Albert, L. A. Refinery Mfg.
Clark, Earl E., So. Div. Field
Clem, Daniel D., Northwest Territory
Culp, Geo. J., Oleum Refinery Mfg.
Garofalo, Ross J., Research-Wilmington
Godman, Louise M., H. O. Traffic
Hall, Russell W., L. A. Refinery Mfg.
Hansen, Hjalmer, H. O. Treasury
Hill, Kenneth B., So. Div. Field
Hinnen, Wm. A., Southwest Territory
Johnson, Chas. F., L. A. Refinery Mfg.
Johnson, Gerald, So. Div. Field
Kearney, Margaret G., H. O. Credit
Lawrence, L. C., L. A. Refinery Mfg.
McMillin, Elzie F., Oleum Refinery Mfg.
Olsen, Leo W., Oleum Refinery Mfg.
Owens, Arthur J., Oleum Refinery Mfg.
Phillips, Harold I., L. A. Refinery Mfg.
Stone, Gregory B., Oleum Refinery Mfg.
Temple, Harold S., H. O. Credit
Valerro, Vernon F., Oleum Refinery Mfg.
Walker, Chas. S., So. Div. Field
Zenger, Adolph, Northwest Territory

Twenty Years

Cooper, Orion L., Oleum Refinery Mfg.
Houghton, Leroy B., H. O. Treasury
Plantiedi, Michele, Southwest Territory
Prifogle, Hugh G., L. A. Refinery Mfg.
Smyth, Hugh R., Southwest Territory
Williams, R. T., H.O. Mfg. Plant Proc.

Fifteen Years

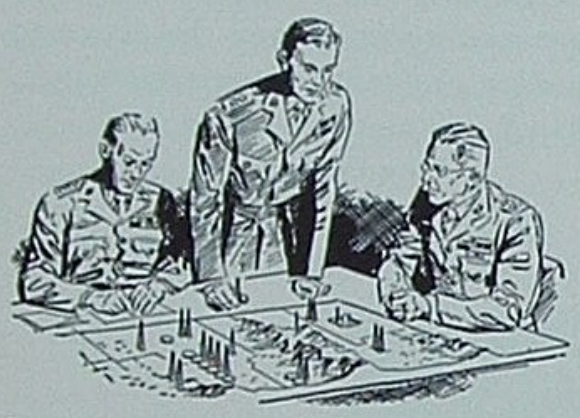
Dutcher, Frank C., L. A. Refinery Mfg.
Fritz, Edward B., H. O. Exploration
Gott, Raymond, L. A. Refinery Mfg.
Graef, Howard W., L. A. Refinery Mfg.
Howard, H. E., Research—Wilmington
Lewis, Richard V., Oleum Refinery Mfg.
Link, Donald B., L. A. Refinery Mfg.
Meserve, Norman L., Northwest Terr.
Peterson, C. F., Research—Wilmington
Rath, Joanne M., H. O. Controller's

Ten Years

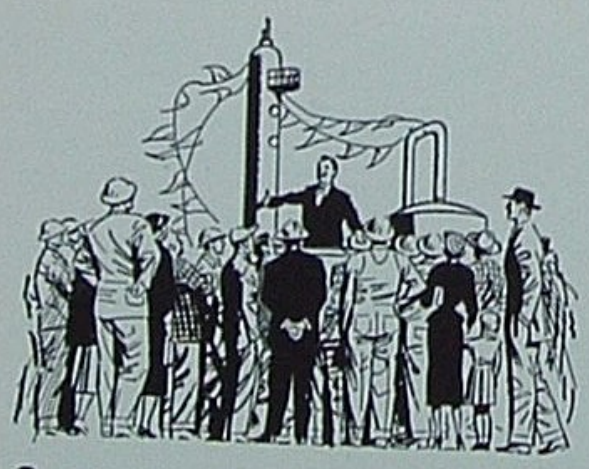
Abraham, M. J., Marine—Wilmington
Bailey, Thomas E., Southwest Territory
Benbury, Alma E., Marine—Wilmington
Birch, Harry A., Cut Bank, Mont.
Blaylock, W. J., Southwest Territory
Blessing, V. A., Southwest Territory
Briggs, Loran J., Oleum Refinery Mfg.
Brewer, C. G., 1/13, Balboa Canal Zone
Crowley, Wm. J., Central Territory
Daneri, Henry W., Oleum Refinery Mfg.
De Garcia, Castillo, Balboa Canal Zone
Fosdick, Norman K., Northwest Terr.
Green, Vincent J., Cut Bank, Mont.
Higbee, Lawrence B., H. O. Comptroller's
Jones, Taylor A., Southwest Territory
Keating, Gerald O., Central Territory
King, Wm. A. Jr., Oleum Refinery Mfg.
LoFortune, G. A., L. A. Refinery Mfg.
Smith, Ercell H., No. Div. Pipeline
Giesey, Samuel C., West Texas Div.
Nevins, Fred A., Marine—Wilmington

What's bad about profits now?

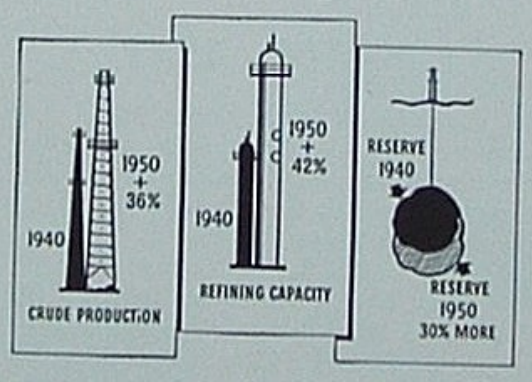
1. During the past 20 years, a great many uncomplimentary things have been said about profits. In fact, profits have been so thoroughly lambasted by left-wing propaganda that a great many honest Americans were beginning to wonder if maybe there wasn't something evil about them after all.



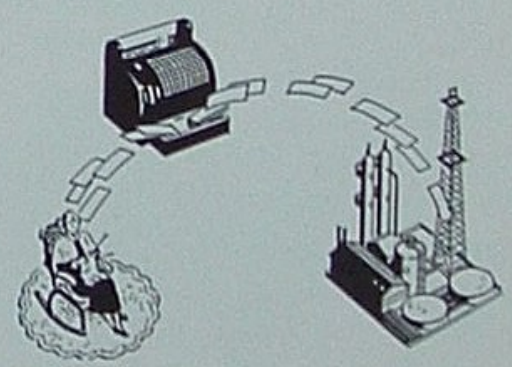
2. Today the answer is plain. The oil industry, as one example, has had some profitable years since 1945. Now, in 1951, America is faced once again with the prospect of all-out war. In war, as in peace, petroleum is the lifeblood of a nation. (During World War II, 60% of the tonnage required to supply our armed forces consisted of petroleum products.)



3. Today the U. S. oil industry has from 1/3 to 1/2 *more capacity* than it had in 1940. Profits, and profits alone, have made this possible. First, *88% of that increased capacity has been paid for out of profits.* Second, what new capital has come in to make up the other 12% was attracted by the earning record of the industry.



4. As a result, the industry today is producing 36% more crude each day than it was in 1940. (Union Oil produces 71% more.) The industry has 42% more refining capacity. (Union Oil has 54% more.) And finally, in spite of all the oil we used up during World War II, the industry has 30% more underground crude oil reserves today. (Union Oil's reserves are 49% greater.)



5. So, next time anyone starts ranting to you about profits remind him of this: Only 40% of the average oil company's net profits go out to the stockholders in dividends. The bigger share goes into replacing and expanding facilities. Without this expansion in the oil industry—and other industries as well—America's productive capacity could never have grown big enough for the tasks that lie ahead.

UNION OIL COMPANY

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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 17, Calif.

Manufacturers of Royal Triton, the amazing purple oil.