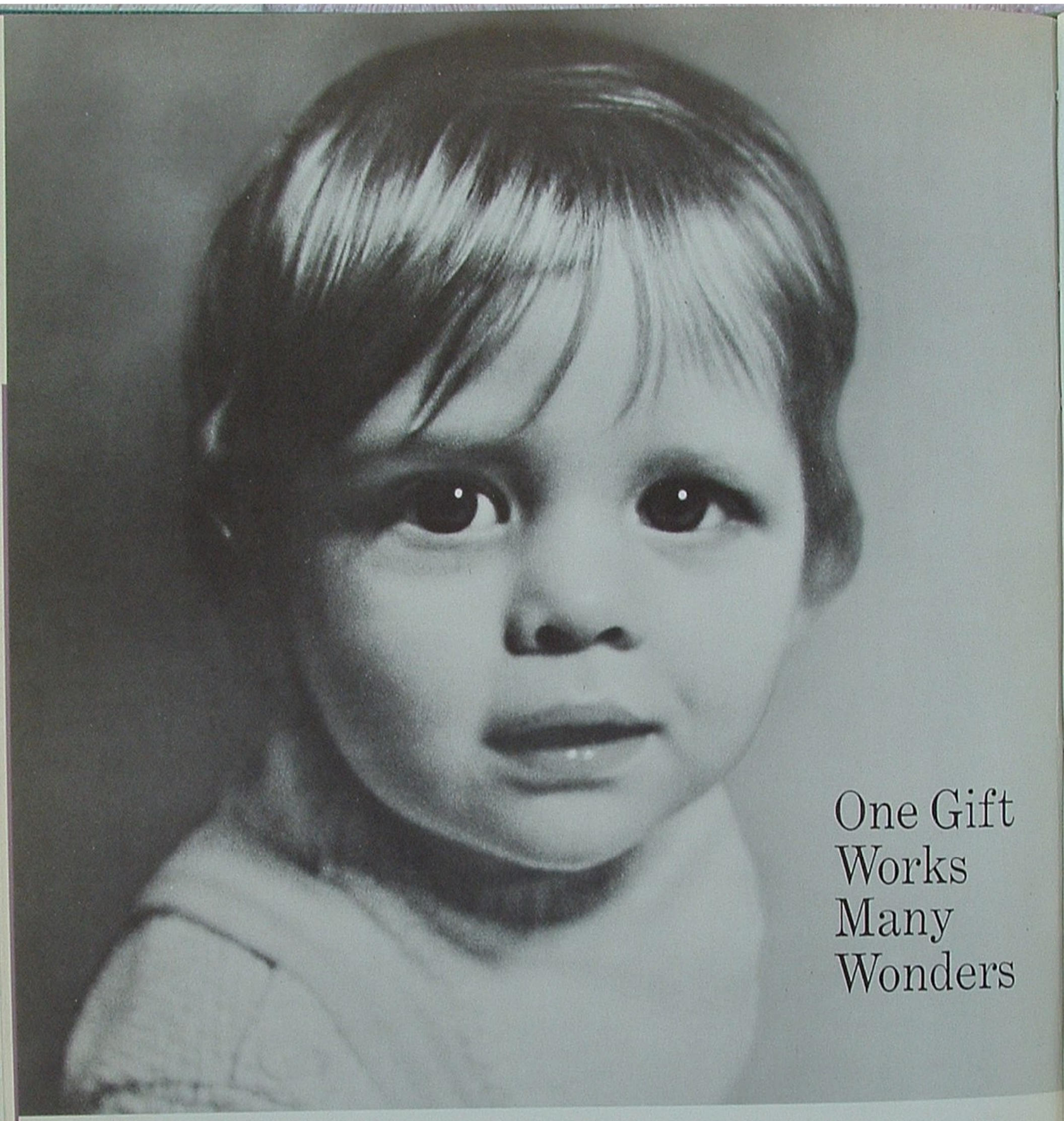

SEVENTY SIX
UNION OIL COMPANY OF CALIFORNIA
76
UNION
SEPTEMBER 1964



One Gift Works Many Wonders

THIS YOUNGSTER represents millions who receive help each year from the agencies and services of your local charity campaign. He is a symbol of their hope, their need, their gratitude. And he serves to remind us of the work that is yet to be done in every community, of homeless children who crave love, of the elderly who seek dignity and fulfillment, of crippled and handicapped people who simply want a chance to help themselves, of families who need guidance, of the distressed who want friendship, of thousands of sick who must be healed. When you think about it, this youngster is really our conscience. Whatever your local charity drive, be it the AID-United Givers in Southern California, the Bay Area United Crusade in San Francisco, the United Good Neighbor Fund in Seattle, or what it may be called in your area, Union Oil Company endorses combined drives and urges employees to contribute through these organizations whenever possible. After seeing the youngster above, how can we deny him? 76

Letters

We invite readers to participate in an exchange of ideas and information. Address: Editor, Seventy-Six; Union Oil Company; Box 7600; Los Angeles, California, 90054.

Angela's America

• Frank Kerth of Union Oil Company here in Anchorage (gave) me a copy of your July-August issue of SEVENTY-SIX which carries "What America Means to Me" by Angela Kutas....

We would like to reprint this article in the Anchorage *Daily Times*. I am sure all of us in Anchorage would like to read what Mrs. Kutas wrote.

ROBERT B. ATWOOD, EDITOR
Anchorage, Alaska

Hong Kong story

• (Just saw) your March-April issue (which) looks mighty sharp. Have you done anything to get the story on the inside front cover ("Incident over the Pacific") picked up for reprint? – like perhaps the *Reader's Digest*. It's a classic.

ANN DEL VALLE
Stevens Productions
Culver City

Eastern reader

• Please continue sending SEVENTY-SIX magazine. I was shop foreman for Kelly Auto Sales in 1948 when hydraulic valve lifters came out. In 1948 and '49 we had two men who didn't do anything but overhaul valve lifters. Your salesman came in one day with Royal Triton and talked me into trying it in the noisiest engine we had. I did and the results were so good I still use it.

HAROLD HAHN
Baltimore, Md.

Retired now

• I read it (SEVENTY-SIX) from "kivver to kivver." Am retired now, but worked for Union from 1920 to 1946. I send the magazine to Ted Banman, also an old Union employee, who is now a farmer in Aberdeen, Idaho. If you see Cy, tell him hello for me.

A. W. BALL
Anderson, California

SEVENTY SIX
UNION OIL COMPANY OF CALIFORNIA

VOLUME 8 NUMBER 7 SEPTEMBER 1964

ABOUT THIS ISSUE

When it came to writing about the petroleum industry's broad role on the farm today, there turned out to be far too much material for one article. A division was made, somewhat arbitrarily, between the mechanical energy provided by the oil industry, and the fertilizers and weed and insect controls supplied by our allied petrochemical industry. An article dealing with mechanical energy on the farm begins on page 2; in a future issue we'll look into the other side of the story.

If you like historic pictures, you should enjoy the pictorial history of our service stations beginning on page 6. Sometime soon we'll take a look at some of our old-time transport trucks.

Be sure to read about the maestros of the Pipeline Department who have grown electronic arms.

There are three short articles about Union Oilers and their families on page 23; we'd like to see more of these coming in from our correspondents.

COVER: Seem strange to be plowing in September? Not if you live in California or Arizona where farmers plant crops the year around. For more about our farms, see "What Ever Happened to the Hoe?"

76 UNION is a Union Oil Company of California trademark. It also symbolizes the American freedoms won in 1776, which made possible this nation's industrial development and abundance. Our SEVENTY-SIX magazine mirrors industrial freedom through the thoughts, skills, accomplishments and appreciations of Union Oil people.

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Working by hand, it took 175 man-hours to produce a bale of cotton. Today, using the machines shown above, the time has

What Ever Happened to the Hoe?

The American farm fills our tables to brimming today, and does it at lower cost than at any time in the history of mankind. The petroleum industry has played a significant role in making this possible.

LET'S FACE IT, thirty years ago our farmers weren't doing so well. Before World War II, potato growers complained their seed stock was running out—yields were getting smaller. Tomato farmers lost entire crops; cabbage growers were in trouble and the sugar-beet and sugar-cane people were threatened with extinction.

When the great drought of 1934 blackened the nation's skies and left dry-farms barren, the farmer was in a desperate situation. By 1935 soil erosion had progressed to the point where it became a national emergency.

Today, only three decades later, the American farmer produces the equivalent of 12,000 calories a day for every man, woman and child in the country—enough to feed a billion persons. There is enough surplus wheat and corn in our granaries to feed 470 million people all the calories they need for a year.

What is responsible for this dramatic transformation? The answer lies in a change so sweeping it has been called the second agricultural revolution. There has been more progress on the American farm in the last 30 years than

...been cut to 61 man-hours.

Photos by Joe Munroe

farming had seen in the previous 30 centuries. Indeed, George Washington would have felt more at home on a farm in Julius Caesar's day than he would on a modern California lettuce farm.

Three breakthroughs made this revolution possible: improved seeds such as hybrid corn; better soil management with irrigation, terracing and crop rotation; and mechanizing the production of crops from land preparation to distribution of the harvest.

Researchers at our agricultural colleges deserve credit for the improvements they have made in seeds. Hybrid corn stands as the single most important seed development, for it opened the eyes of depression-day farmers to improved harvests from scientific agriculture. Better soil management was a product of research, too, but it remained for the gasoline tractor and chemical fertilizers to make the dream of soil management a reality. No less important was the application of the internal combustion engine to crop production. Today, western farms employ half a million tractors on the farm and they burn a billion gallons of gasoline each year in running them.

It was the western farmer who threw away his hoe and asked, "What can the gasoline engine do for my sugar beet? What can chemicals do for a strawberry, a cotton crop? Can rice paddies be mechanized?"

Today the western farmer is harvesting the fruits of mechanical and chemical inventiveness. Using a diesel-powered tractor, he can plow 50 acres a day (or disc 200) and have time at night to see the latest movie. Compare this with the plight of grandfather who walked behind a horse and plow from sunrise until past sunset.

The West is full of examples that show how petroleum power has made possible the revolution in agriculture. California farmers employ road graders and earthmoving machinery, usually seen only on highway construction, to level land for rice paddies. Thanks to a special implement, the farmer can form his rice paddies by machine instead of by backbreaking labor.

The farmer today may use a ramjet wind machine, adapted from a helicopter rotor, to prevent frost in his fruit or nut orchard. The machine's supporting column serves as a 1,000-gallon fuel tank, and one machine protects 20 acres at a cost of $24 an hour vs. $56 an hour for smudge pots.

There are more examples. At a carrot farm south of San Francisco, a mechanized farm operator has built a mobile packing plant that prepares carrots for the marketplace right in the field. It plucks, cleans, trims, sorts and packs carrots into one-pound polyethylene bags. And it runs on gasoline.

A mechanized potato harvester at Zuckerman Farms near Stockton, California, has cut the cost of digging potatos from 17 cents a hundred to 8 cents.

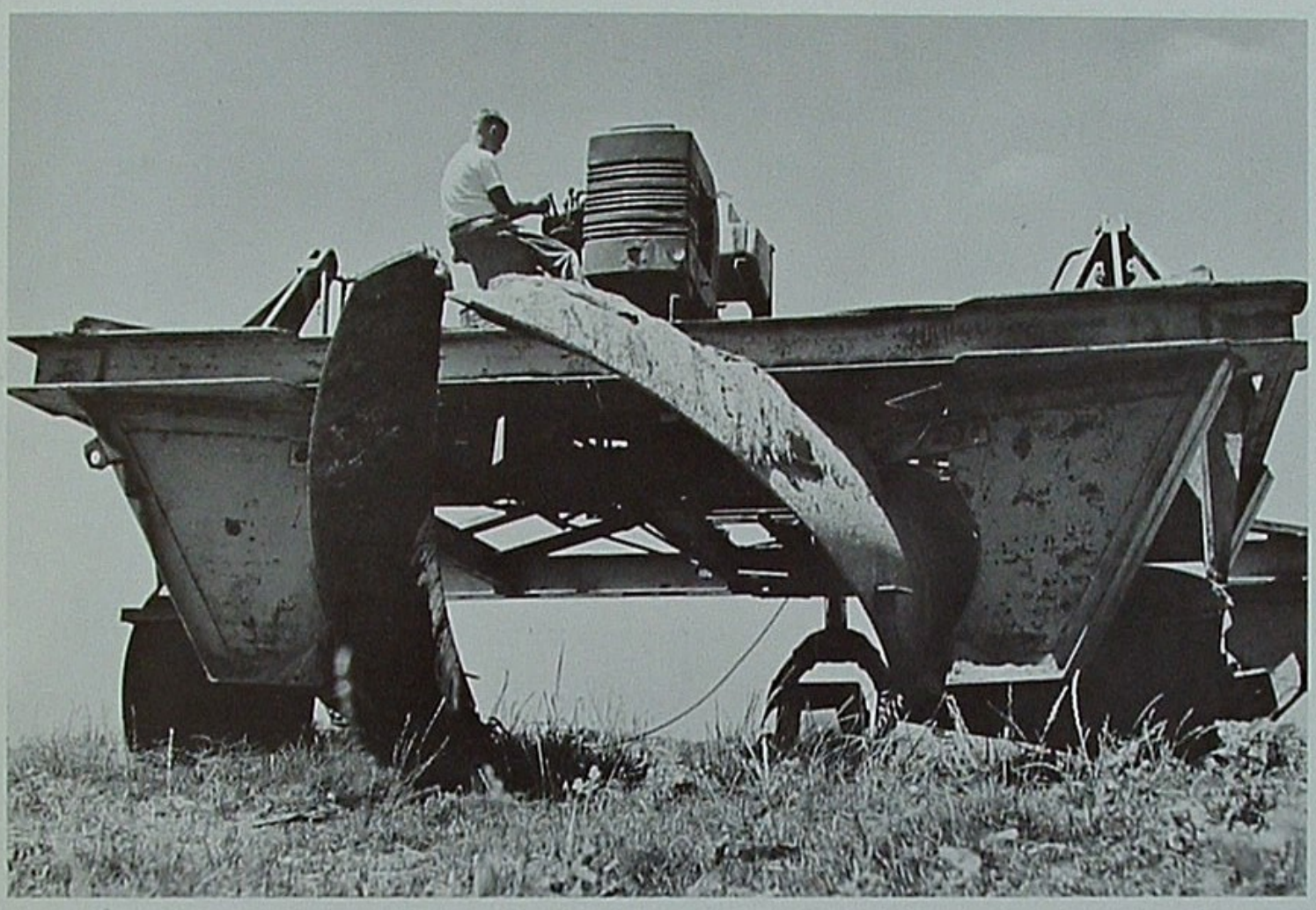
In the nut orchards, a mechanical tree shaker, using a steel arm with a rubber-cushioned claw, grips a tree and shakes nuts from it in five seconds. The nuts are caught in a self-propelled catching frame and carried to bins. Prunes also are being harvested with this shaker, and farmers are experimenting with similar frames designed to catch peaches and apricots without so much as a bruise.

continued

Asparagus, always a difficult crop to clear after harvest, today is plowed and cleared in one operation. The Stefani and Mantelli Brothers Farm near Stockton has a Rototiller-like machine that cleared 4,000 acres of asparagus fields last summer.

In Orland, California, the Otto Rehse and Sons Farm has a vacuum-operated clover-thresher. They built the self-propelled thresher which sucks up clover like a giant vacuum cleaner. As with many of the machines described in this article, it is fueled with Union Oil products.

The engine in field and orchard has freed men from a lifetime of grinding labor and given them an opportunity for skilled and professional careers. In 1830 great-grand-



PADDY FORMER: *Building rice paddies by hand was once one of the hardest jobs on the farm. This gasoline-powered machine now handles the onerous chore quickly, neatly.*

TREE SHAKER: *Prune and nut picking have been turned over to this mechanical tree shaker which grips the tree and shakes fruit and nuts into a self-propelled catching frame. Peaches may be next.*

POTATO PICKER: *A mechanized potato harvester at the Zuckerman Farms has reduced the cost of digging potatos by half. Equipment is powered by Union Oil Company fuels and lubricants.*

father spent an average of three man-hours to produce a bushel of wheat. Grandfather did it in 1896 with a horse-drawn plow and spent a man-hour per bushel. The tractor appeared early in the 20th century and dad produced a bushel of wheat in eight minutes. Today your cousin on the farm uses a self-propelled implement to do it in four minutes.

It's a moot question how many men are working today as salesmen, geologists, refinery operators, chemists and truck drivers who might have been destined to a lifetime on the farm had they been born 100 years ago. But we know this: The grandson of a 19th century horse-and-plow farmer is driving a transport truck, delivering the fuel that will power dozens of tractors. The nephew of an immigrant Chinese coolie who spent his life stooping over lettuce fields is a research chemist. True, the tractor took men off the farm, but it gave them a better life.

Look at the revolution on the farm from another viewpoint: How many of us have been freed for a better life because of machines? In 1820 in the United States, 87 per cent of the people were working on farms. A century later the farm population had dropped to 30 per cent, and today it appears to have stabilized at about 10 per cent. The relationship to our improving standard of living seems more than coincidental.

The tractor and weed sprayer have given us, as consumers, a better way of life too. In 1940 it took 40 cents out of every wage dollar to buy food. In 1964 a family spends only 20 cents of its dollar for food—a built-in pay hike of 20 per cent. The extra money, in turn, has been made available for a better standard of living—for new homes, cars, appliances or for savings and education for our children.

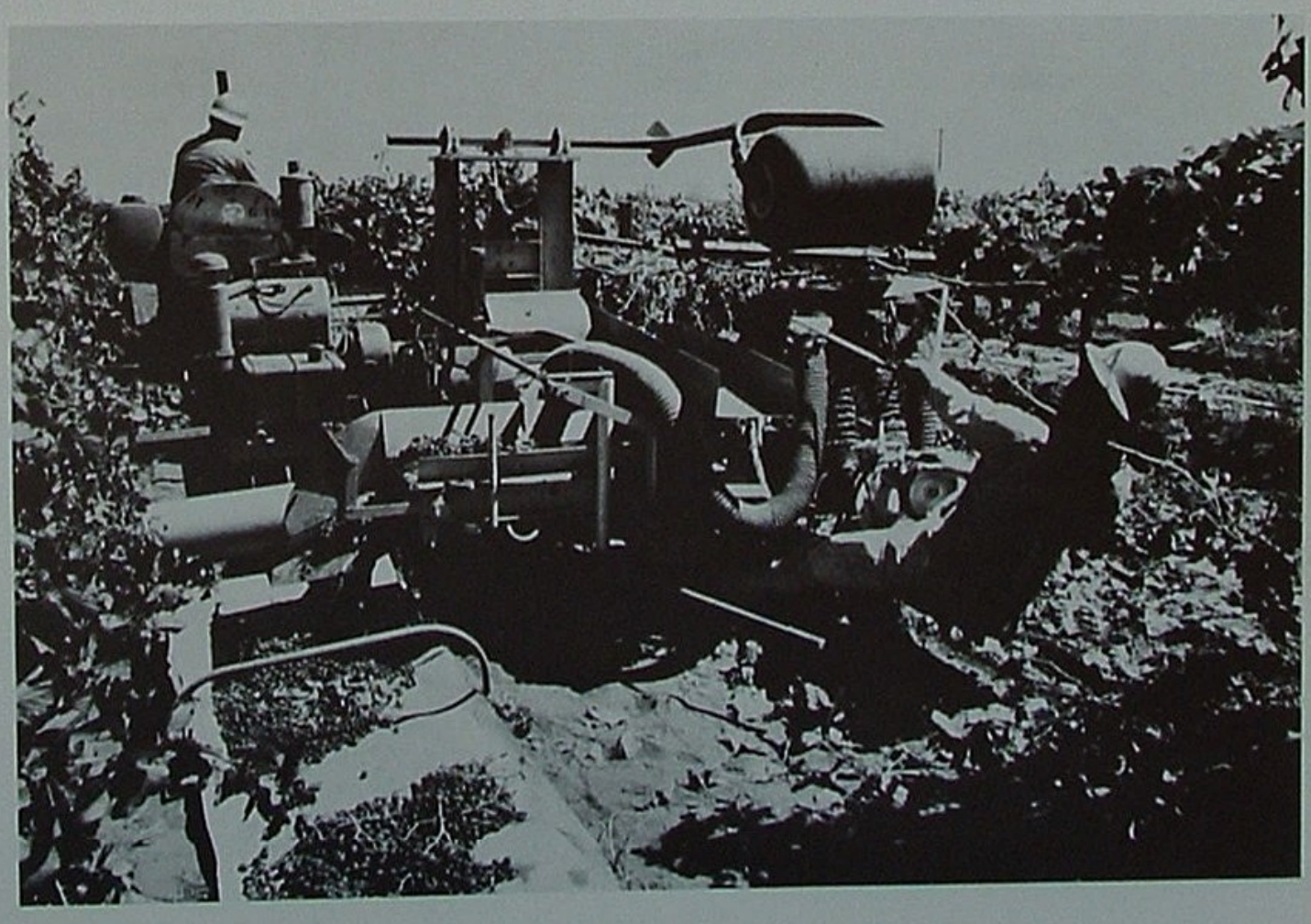
As consumers we also owe no small credit to the farmer for the variety of foods that fill our tables today. In 1900 there were fewer than 100 food items readily available to the American public. Today there are 10 times that many, most of which are either new or have been improved materially in the last 15 years.

As members of the petroleum industry, we share in the farmer's progress, for it is as a result of our efforts and ingenuity that much of this has been made possible. Just how directly we share has been dramatized by the economics of the cotton farmer.

The University of Arizona earlier this year published a guide showing estimated costs and returns for producing upland cotton. Farmers living near the Salt River Project, the report said, could estimate receipts of $442.06 for an acre of top quality cotton. Of this amount, fixed costs for land rent and taxes would total $78.50 an acre. Cash costs, ranging from land preparation to ginning, were $248.70 an acre. The farmer could expect a profit of $114.86 an acre—or $57,430 for a 500-acre cotton farm in one year.

Significant to the petroleum industry, however, is this: Of the $248.70 an acre in cash cost, all but $32.30 (which goes for seed, interest, insurance and social security) is spent on some form of energy, fertilizers, irrigation or weed control. In other words, the cotton farmer will spend $216.40 an acre for plowing, planting, cultivation, thinning, irrigation, picking, hauling and ginning, and for weed and insect control and fertilizer.

We in the petroleum industry provide the energy for these mechanical operations; our allied petrochemical industry produces the fertilizers, insecticides and weed controls. No wonder the farmer became the oil industry's biggest customer when he threw away the hoe. (76)



GRAPE HARVESTER: *The machine with the best potential for changing stoop labor to skilled labor is this grape harvester. Long stem grapes must be developed before machine is practical.*

Half a Century of Service Stations

APPARENTLY NO ONE knows who built the first service station. One company claims it opened a retail unit in Seattle in 1907. According to Union Oil records, our first station was opened in 1913 at Sixth and Mateo Streets in Los Angeles. Yet the September, 1924, issue of the Union Oil *Bulletin*, predecessor of SEVENTY-SIX, carries this passage: "The first unit to be opened by Union Oil Company (was) in Tacoma, Washington. J. C. Cosgrove opened this station in November, 1909, and is still operator at this station."

Perhaps the question may never be answered. Union's stations may not be the oldest, but they have long had a reputation for being the finest—both in products and design. In the 1920's, the company sponsored a public contest for new station designs, the best features of which were incorporated into several of the stations shown on these pages.

In the 50 or more years that Union Oil has been operating service stations, the company has adopted 38 official station designs, plus a few experimental units that remained unique. Six of the 38 official designs are shown here. The latest stations are the Type 300 and what may become its successor, the Type 300-R. As these pictures indicate, we've come a long way since those early days.

1910's: *As far back as the mid-1890's, the Union brand appeared on cans of gasoline sold for horseless carriages. But until about 1915, the service station was a rarity; motorists bought their fuel at a hardware store or at a marketing terminal. Here is one Union marketing terminal; picture is circa 1910.*

1920's: *As autos and paved roads became common in the 'twenties, service stations became familiar on street corners. The Roaring Twenties was a period of great service station expansion; Union Oil alone approved 18 new station designs. This unit, built in 1923 at Woodland, California, was operated by the late E H French.*

1930's: *Only two station designs, the Types 21 and 105, were approved for use in the depression-age 'thirties. This unit, a Type 105 design appearing in 1935, reveals a trend toward rounded corners and a double canopy to offer better service to customers.*

1940's: *After a period of relative inactivity, station designers turned to their drawing boards in the 'forties, coming up with 10 new station designs. Typical of the Union stations in that period was this Type 120 unit that appeared in 1947. Note the lengthening canopy.*

1950's: *With the appearance in 1953 of the Type 140 station and its sweeping canopy, Union station designers put away their drawing boards for nearly a decade. The 140 and its cousin, the twin-canopy 240, were the basic Minute Man units in the West for almost 10 years. They were often called the most beautiful service stations in the United States.*

1960's: Progress brought on by new auto styles, new technology and new architectural tastes in the 'sixties resulted in the Type 300 station which came out in 1961. Since this unit was built in Parker, Arizona, the use of the "Union 76" sign above the canopy has been discontinued; in its place is a "76" sphere at the corner.

1964: Below is the latest Minute Man station, the Type 300-R, which bids to succeed the Type 300. Note in particular the handsome shake roof and flagstone wall. Entrance to the lube room is at the side, out of sight. This station is at La Veta and Bedford Streets in Orange, Calif.

Twin Devils of Combustion

(Summary: Last month we saw how to blend gasoline for quick starting, fast warmup and mileage. In this article, we'll see how to eliminate knock and halt surface ignition—the twin devils that rob your engine of power.)

EVER GET INTO a bull session with a bunch of do-it-yourself mechanics, and run into the guy who knows it all?

"Premium's too hot for my car," he declares, "It'll burn up the valves."

If you're not in the gasoline end of the oil business, this may trip you up. Somehow, you think the statement must be false, but you don't know exactly why. If you're looking for the answer, here's the story from the man who knows. He is Dr. Ray Mattson, former leader of the fuels research section at Union Research Center.

"The statement is pure poppycock," Dr. Mattson assures us. Actually, the mistake is rooted in a forty-year old myth that says premium gasoline gives more power because it burns hotter. As we saw last month, it is the high Btu-content of a fuel that provides power.

"So," you ask, "what's all this talk about high octane gasoline?"

Dr. Mattson explained it in one sentence.

"A premium gasoline—that's one with a high octane rating—lets a car deliver full power from the gasoline without fuel knock."

If the answer sounds more complicated than the question, let's try this analogy. A high octane gasoline acts something like a boxing glove. With or without the glove, a boxer can deliver just as much power. But without the glove, he might do a lot of damage to his hands as well as to his opponent. The glove prevents damage.

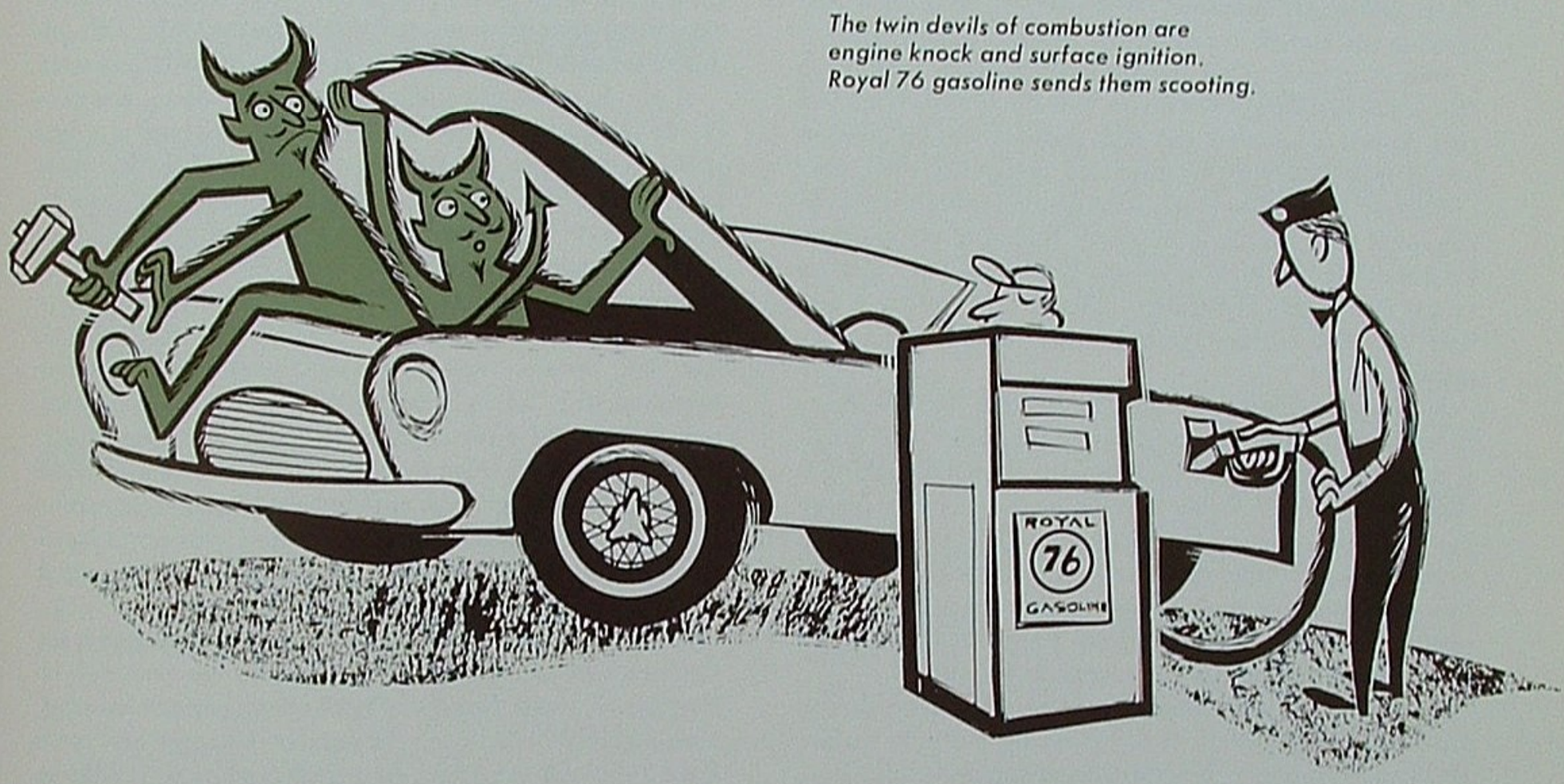
Like a glove, a high octane rating in gasoline lets a modern engine deliver full power without danger of fuel knock that might do a lot of damage to the engine. Let's look at this in a little more detail.

Gasoline, some scientists claim, has about three times as much energy as TNT. Yet when gasoline burns properly it never explodes like TNT. Gasoline burns in a rapid but controlled wave of flame, something like a fast-moving prairie fire.

During this burning period (only thousandths of a second), the pressure in the combustion chamber of your engine increases evenly, delivering a smooth flow of energy to the wheels.

In a knocking engine, things are different. The flame begins in a normal, prairie-fire manner, building up heat and pressure. But the low octane gasoline is unable to withstand much heat and pressure. If this heat and pressure become high enough, the unburned portion of the fuel-air mixture will autoignite. The vapors in a far corner of the combustion chamber (well ahead of the flame) will explode violently. This sets up a high pressure wave that bounces back and forth across the combustion chamber. It is this rapidly bouncing pressure wave that produces the knock or ping you hear.

Some persons, when talking about low octane gasoline, say, "Oh, yes, it burns too fast. That's why it knocks." According to Dr. Mattson, this is not so. His point is proved by high-speed movies taken through a thick glass porthole in the cylinder head of an engine. Films shot at 40,000 frames a second show a wave of flame moving in the normal prairie-fire manner. There is no speedup of burning rate. What happens is that the unburned air-fuel mixture ahead of the flame front can't take the pressure and temperature that are generated. The mixture suddenly ex-



The twin devils of combustion are engine knock and surface ignition. Royal 76 gasoline sends them scooting.

plodes, violently. Everything on the screen vibrates.

Call this knock or ping, as you like, it delivers a hammerlike blow to the pistons. Because the pistons can't move fast enough to absorb this unexpected explosion-produced pressure increase, the energy is dissipated as heat. This not only robs you of power, it overheats your pistons and valves.

In addition to power loss and rough running, severe and prolonged fuel knock can burn pistons and damage bearings. It can cost you major repair bills. Obviously the prudent thing to do is eliminate knock.

According to Dr. Mattson, two ways are known of eliminating knock. One involves adjusting your car; the other means adjusting your gasoline. In your car, knock can be reduced by retarding the ignition timing, but this cuts power so it is largely self-defeating. The gasoline can be improved in two ways:

—First, by adding chemicals such as tetraethyl lead (called ethyl or TEL) or tetramethyl lead (called methyl or TML), and:

—Second, by upgrading the hydrocarbon molecules in the gasoline itself. Most of the refinery research in recent years has aimed at upgrading low octane gasoline components into high octane stocks.

The cause of this expensive research is the high compression ratio engine. Motorists have been demanding more power from their cars. At the same time, they demand good gasoline mileage—which means higher efficiency. Engineers know that the only way of increasing both power and efficiency is to increase the compression ratio. The only catch is this: Without high octane fuel, high compression engines will knock themselves to pieces. So octane ratings had to be boosted until engines didn't knock.

When is comes to compression ratio today, Detroit is producing two groups of cars: First, relatively low (8 or 9 to 1) compression ratio economy cars for which the manufacturer recommends regular gasoline; second, high compression (10 to 1 and higher) high performance cars that demand premium fuel.

Most of the cars on the road today are older cars, many of which have lower octane requirements than the new cars. For example, Regular 76 gasoline today satisfies the octane requirements of about 65 per cent of all the cars on

continued

Twin Devils *continued*

the road. Royal 76 gasoline takes care of the rest of them.

So far, so good. One devil licked, but we hinted of two. The second combustion problem sometimes sounds like fuel knock (and sometimes doesn't), but it's a horse of a different breed. Most of the general public isn't even aware of it, but research men are busy studying what they call surface ignition. There are a variety of symptoms, but the problem finds its roots in little hot spots in deposits on the inner surfaces of the combustion chambers of your engine. These seemingly innocent hot spots seize control of the ignition and run off in a multitude of sins. Among them:

UPSETS TIMING: One trouble with surface ignition is that it doesn't always warn you. But the trouble is no less real. As just mentioned, the main cause of surface ignition comes from "carbon" deposits that get so hot they glow and ignite the fuel mixture. Any ignition other than from the spark plug results in improper timing of combustion. Improper timing in turn means loss of power, because power is critically dependent upon timing. Whether you hear it or not, surface ignition upsets timing and causes power loss.

SURFACE IGNITION KNOCK: This sounds like ordinary knock or ping, but it is erratic, hence the name "wild ping." It may be accompanied by normal fuel knock, making it difficult to detect. When surface ignition occurs before the plug fires, it is called preignition. The extreme high pressures and temperatures caused by knocking preignition may break or melt pistons, and damage valves and bearings. In fact, cases of severe preignition have been known to destroy an aircraft engine in seconds.

—RUMBLE: This phenomenon is so new many drivers have never heard of it. It is caused by multiple surface ignition. Fortunately it is rare, occurring only at high engine speed and high load in the highest compression engines. It is a lower pitched sound than ordinary fuel knock. In fact, some drivers say it sounds like dragging a baseball bat along a picket fence. If you experience rumble while driving, slow down and get a new gasoline—Royal 76.

Each of these problems are symptoms of surface ignition. They are caused by any hot spot that glows inside the combustion chamber of your engine.

To overcome the power loss and engine roughness that accompanies surface ignition, you need a gasoline with a special additive. Fortunately this is available. The special gasoline contains an ignition control compound that modifies carbon deposits so they do not glow at normal engine temperatures. Royal 76 gasoline contains such an additive that is very effective in overcoming the problem. This additive in Royal 76 reduces surface ignition by 80 per cent.

Here, then, are the things to remember about the twin devils of gasoline combustion. What once was a single problem of knock has today become twins. High octane gasoline will solve the knock problem. But it takes an ignition control additive to get rid of surface ignition. That's why experienced gasoline men say, "There's more to premium gasoline than octane."

And contrary to what your do-it-yourself mechanic-friend may say, premium gasoline won't burn up your valves. Premium isn't "hotter" than regular. In fact, in a properly tuned, high compression engine, premium gasoline actually will burn cooler than regular. That's because the engine would knock with regular, resulting in overheating of combustion chambers. And permitting your car to knock with regular would probably lead to surface ignition, which would hasten valve burning.

Both Regular 76 and Royal 76 gasolines have much the same power—i.e. energy content. If your car runs well on Regular 76, use it. But if you have a high performance car, most likely it will knock on regular. Chances are you'll need Royal 76 for knock-free performance. In addition, Royal 76 prevents surface ignition. ⑦⑥

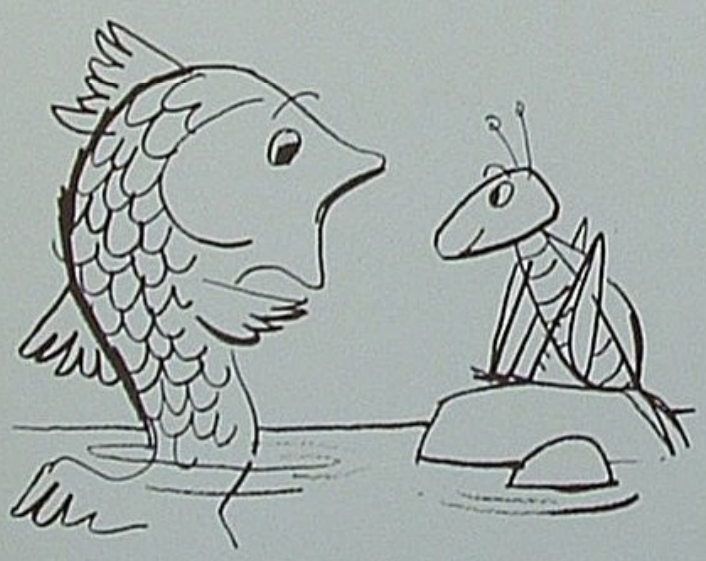
(Next: A chemical tuneup in every gallon)

DAMAGE: *This isn't likely to happen, but it could. Severe cases of preignition have destroyed an aircraft engine in seconds.*

QUALITY: *Gasoline must meet rigid specifications. Stanley D. Chapin, inspector at Oleum Refinery, tests for octane number.*

How the Grasshopper Got His Name

Cheryl Rabe is the 10-year-old daughter of Union Oiler Roger E. Rabe of the Del Valle Field. When Cheryl's fourth grade teacher, Mrs. Barbara Zussman, assigned students to write about the California oil industry, here's what Cheryl penned:

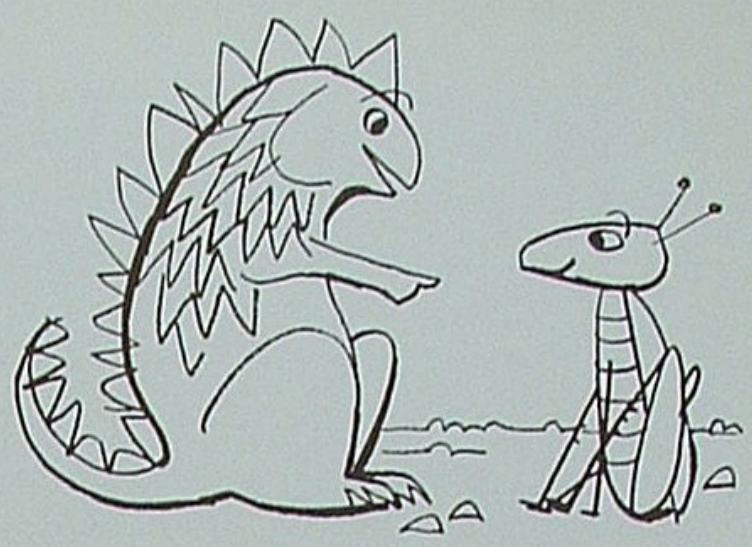


By CHERYL RABE

When the world was young, things were very different from today. One day Grasshopper came to a fish pond. Grasshopper called Fish up. He said, "Fish," and hopped to a lily pad. "Fish, are you important?" Fish said, "No," and was gone.

So Grasshopper went to Dinosaur and said, "Dinosaur, are you important?" Dinosaur said, "No," and shouted, "Go away."

So Grasshopper went on. But he said to himself. "*I* want to be important," so he went to see Master Dinosaur and said, "I want to be important."



Master Dinosaur said, "I think one day there will be a creature called Man. Dig a hole and go to sleep in it, but don't awake until a thousand years or more."

So Grasshopper went to sleep, and for much more than a thousand years. The Master was now Man!

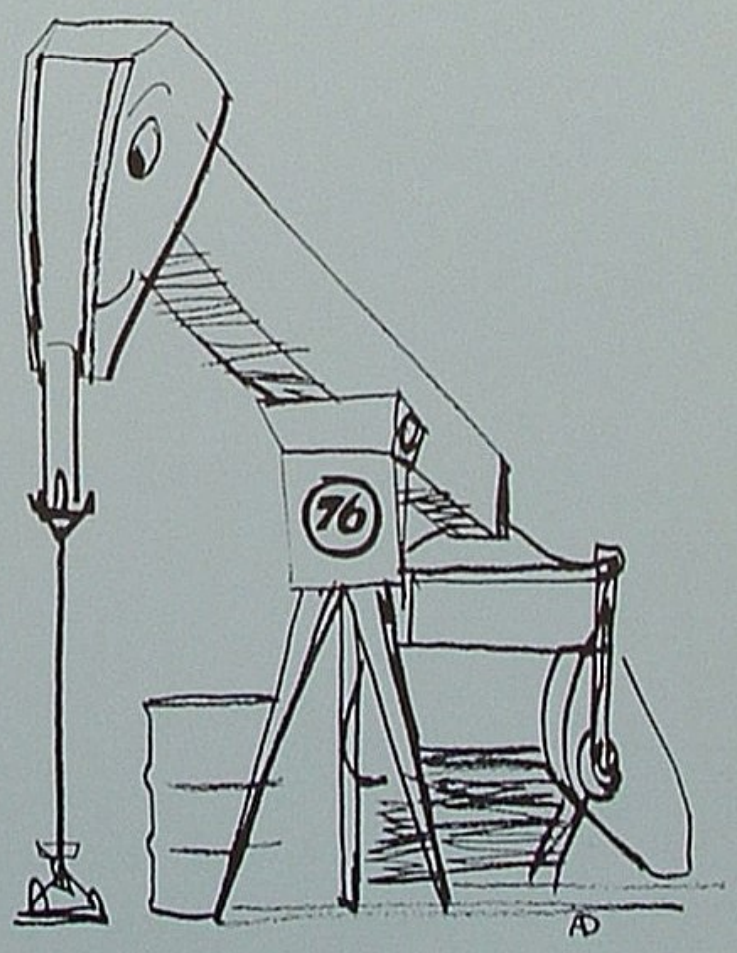
So the Grasshopper went to Master Man and said, "I want to be important."

Master Man said, "I have just the thing for you." First he made Grasshopper big. Then he turned him to steel and made a mark like this on him: ⑦⑥.

Grasshopper asked Master Man what this meant. Master Man said, "It means 76, Union Oil." "But what is that?" asked Grasshopper. Master Man said, "You are now an oil grasshopper."

At last Grasshopper felt important, and that's how Grasshopper got his name.

But today, we call him a pumping machine. ⑦⑥



the ABC's of marketing

A brief roundup of Union Oil Company's latest innovations in the marketing field

SINCE THE LATE 1950's, Union Oil's Marketing Department has introduced a rainbow of new products and services. Our intent always has been to provide the *finest* products. But today there is more. Now we have entered the field of customer services probably more deeply than any other company in the industry. Today our emphasis is on the *finest values* in both products and services. Here, in handy ABC form, is a roundup of these values.

A Accessories

In 1961, Union added a line of branded auto accessories. Your dealer has 76 accessories ranging from seat belts to fan belts, air filters to gasoline filters, radiator chemicals to tire repair materials. They are the finest quality. Use them with confidence.

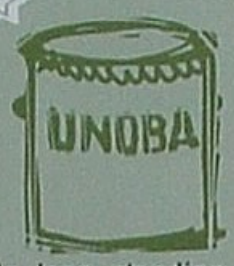
B Batteries

At the same time cessories came out, the company troduced a full line of batteries f passenger cars, trucks, commerc l use, marine engines — even g carts. These Minute Man batte s are made to exacting Union C specifications, and they carry lor warranties.

F Future

While this deals with achievements in the past, it is valuable too to look at the future. Our marketing efforts in the future will emphasize new products and services that make Union stations more convenient than ever to visit. Convenience and service are our keystones.

G Grease



Union's long-standing leadership in greases is being maintained with such company brands as barium-based Unoba grease. Truly multi-purpose, Unoba greases eliminate many single-purpose greases. Moreover, they resist heat, cold, water, steam and corrosive liquids.

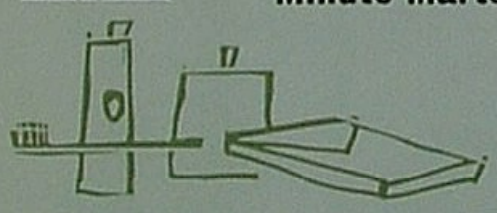
H Hot Food

Motorists sometimes resent the time it takes for a fuel stop. But offer the customer a cup of coffee and hot food, and he's happy. Many Union Oil stations on our Western highways are linking forces with restaurants and coffee shops—for one-stop service.

I Insurance

As a Union Oil c t card holder, you can have pe of mind while driving. Through arrangement with the Insuran Co. of North America, broad co age travel and accident insuranc available, and the billing is ma easy through your 76 credit ca

M Minute Marts



As a motoring convenience, the 76 Minute Mart is making its appearance at many Union Oil stations. Offered in their display cases are aspirin, hair oil, combs, litter bags, suntan lotion, magazines and a score of other items. These are useful for the traveler.

N New Maps

Road maps are favored by all motorists, but they must be accurate. Because of changes in highway numbering systems in Washington and California, Union Oil has issued up-to-date road maps for these states. These new, multi-color maps are really easy to read.

O Oils

Since 1932 when Triton motor oil first appeared, this purple lubricant has set the pace for motor oils. Improved many times since then, the line got its latest boost last spring when Super-Royal Triton was brought out. This oil **exceeds** all car makers recommendations.

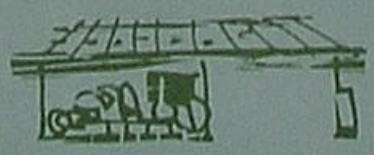
P Parts

In addition to 76 accessories, your Minute Man ler also carries a popular line o parts. These are items such tune-up kits, brake repair kits parts, shock absorbers and versal joints. If you need minor pairs, you can depend on Union

T Tires

Union dealers have a full line of Minute Man passenger car, truck, commercial, winter (snow) and sports car tires. Moreover, the warranties on these tires are famous. On the Minute Man III and IV tires, you have America's first insured tire warranty. Ask your dealer soon.

U Union Stations



Union stations long have been noted for their appearance. To keep pace with progress, there are two new designs. One, the 300, already is familiar. Now the 300R, with shake roof and stone planters, bids to become its successor. Pictures on pages 6-7 of this magazine.

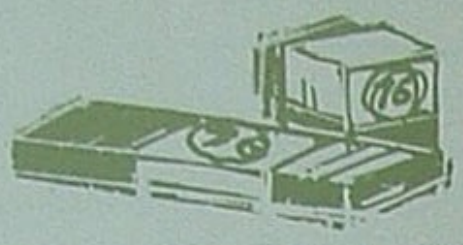
V Vehicle Care

Cars today present new maintenance problems, so your Union Oil dealer offers a program of 35 essential services done every 60 days or 2,000 miles. It's called 76 Certified Car Condition Service. Unless you're a trained mechanic, you need this car care—and the cost is low.

W Weeke Adventure

Seeing your Unio dealer is fun. Not only do you ice, you can g Every week a nev ture folder come points of interes a weekend drive comers to most

A Accessories



In 1961, Union added a line of branded auto accessories. Your dealer has 76 accessories ranging from seat belts to fan belts, air filters to gasoline filters, radiator chemicals to tire repair materials. They are the finest quality. Use them with confidence.

B Batteries

At the same time accessories came out, the company introduced a full line of batteries for passenger cars, trucks, commercial use, marine engines — even golf carts. These Minute Man batteries are made to exacting Union Oil specifications, and they carry long warranties.

C Credit Cards

Your Union Oil credit card has become more valuable than ever. You may now charge tires, merchandise and repairs on a time contract with several months to pay. This can be important when you discover you need tires or engine work just before going on vacation.

H Hot Food

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I Insurance

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J Jet Fuel

Many of the jet planes you ride in the West today are powered by Union Jet Turbine Fuel. (Western Airlines is a good example.) Highly refined and produced under almost hospital cleanliness, Union Jet Turbine Fuel assures you of greater safety when you travel.

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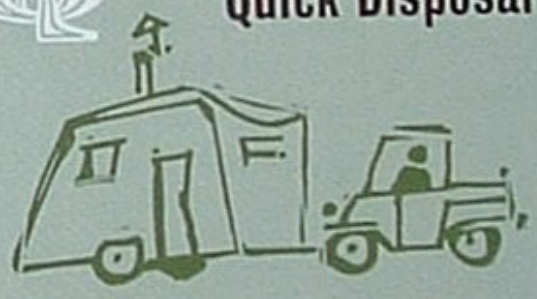
In addition to 76 auto accessories, your Minute Man dealer also carries a popular line of repair parts. These are items such as tune-up kits, brake repair kits and parts, shock absorbers and universal joints. If you need minor repairs, you can depend on Union.

Q Quick Disposal



Trailer owners who have difficulty finding a place to dispose of holding tank wastes are sure to like this Union feature. Holding tank disposal units have been installed at many Union stations. Look for the TCA (Trailer Coach Association) sign at your Minute Man station.

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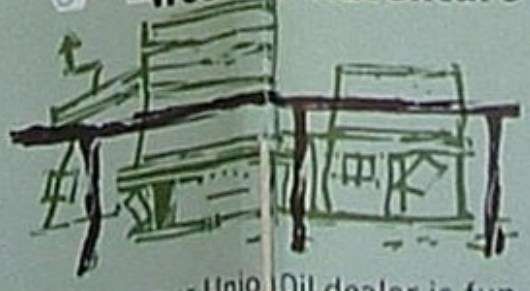

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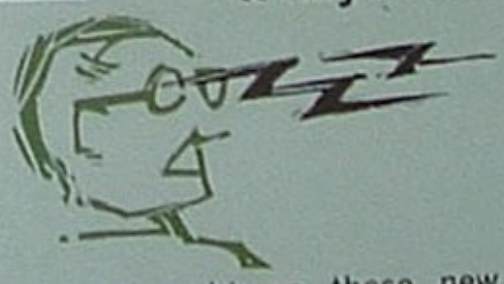
X X-Ray Vision



Someone thought up these new products and services. Let "X" stand for the X-Ray vision of market researchers who detected these motoring needs and the managers who took steps to fill these needs with new products and services at the Sign of the 76.

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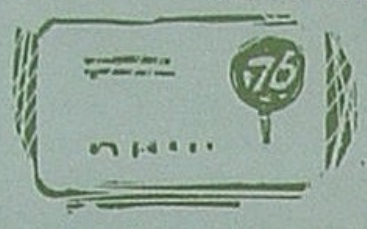

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D Dodgers

Both to win new customers and as a public service to our many friends and clients, Union Oil sponsors radio and TV broadcasts of football, basketball, horse racing, ice hockey and six baseball teams — including the Dodgers. For schedules, consult local listings.

E Experts

If you want an expert who is certified by Union to offer tune-ups, brake service or wheel alignments, look for the Minute Man who wears the orange bars on his sleeve. This means he has passed stiff exams in his fields and is a certified expert.

I Insurance

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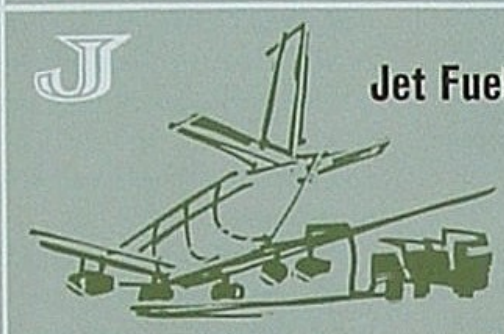
J Jet Fuel



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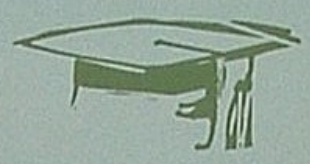
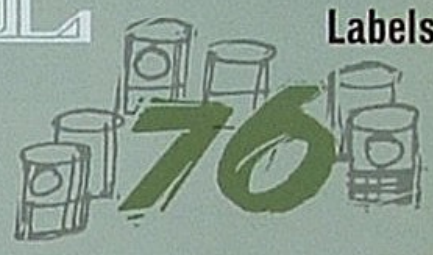
K Knowledge



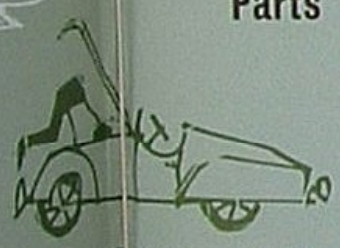
Without a well-trained team to back up these new products and services, it would be folly to introduce them to the public. "K" stands for the knowledge Union Oil dealers and sales experts have gained through Marketing Department training courses. It is vital.

L Labels



Names and labels on our products have been simplified so even our newest customers won't be confused. Oil cans have labels of similar design. Our gasolines, formerly called 76 and 7600, now are called Royal 76 and Regular 76. No confusion there.

P Parts



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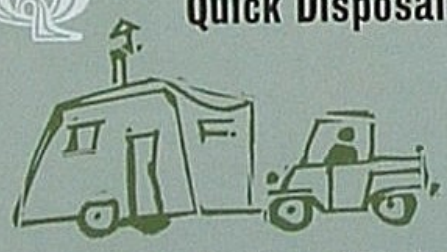

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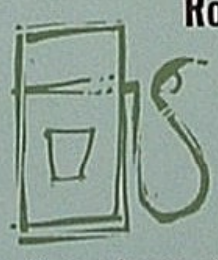
R Royal 76

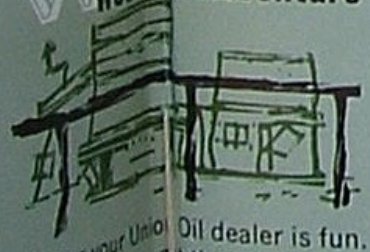


Union gasolines always stand the test of quality. To keep ahead of competition, the company in 1963 took a new step ahead by introducing a Royal 76 gasoline that not only cleans your carburetor but gives your engine a chemical tune-up while you drive.

S Sparkle Girls

Women drivers appreciate good housekeeping at their service stations. Union's corps of Sparkle Girls, who tour the West every summer, make sure that Minute Man stations are up to the finest standards of cleanliness. The 76 Sparkle Corps is unique in this field.

W Weekend Adventure



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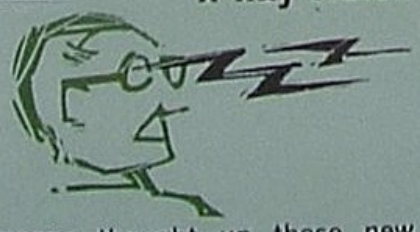

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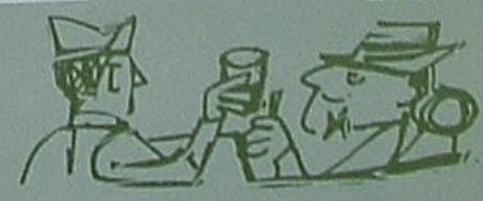
Y Yacht Service

Union marinas supply products and services to fishermen, water skiiers, yachtsmen and boat enthusiasts. Our "76" Outboard Fuel is known as the West's finest product in this line. Tide tables and boating guides are among the other services offered to boaters.

Z Zeal



Finally, "Z" stands for the zeal of Union Oil dealers and their hard-working employees. They are responding favorably to these new products and services outlined here. By satisfying more customer needs, they make more for themselves, the company, its shareholders.

Business Highlights

FRED HARTLEY ELECTED PRESIDENT OF UNION OIL

Fred L. Hartley was elected president of Union Oil Company on August 31, 1964. In that position he succeeds A. C. Rubel, who was elected chairman of the board of directors; Rubel will continue as chief executive officer.

Both actions were taken by the board of directors at its regular monthly meeting in Los Angeles.

Hartley has been executive vice president of the company since November, 1963. He is a director and member of the executive committee of Union Oil and a director of Union's various subsidiaries. He joined Union Oil in 1939, was elected a vice president in 1956 and a senior vice president in 1960.

COLLIER CARBON TELLS PLANS TO EXPAND CHEMICAL PLANT

Collier Carbon and Chemical Company, a 100 per cent Union Oil subsidiary, has revealed plans to double its anhydrous ammonia capacity. With completion of a new ammonia plant at Brea, California, next year, Collier will have an anhydrous ammonia capacity of 240,000 tons a year.

Collier also said it will build urea manufacturing facilities and begin marketing prilled (spherical pellet form) urea and high analysis nitrogen solutions based on urea.

Collier's agricultural chemicals include anhydrous (gaseous) ammonia, aqua (liquid) ammonia, ammonium sulphate, ammonium nitrate prills and ammonium nitrate solutions, plus dry ammonium phosphates and ammonium phosphate solutions. Collier said it would also increase its ammonium sulphate and ammonium nitrate production capacity.

In its industrial department, Collier markets sulphuric acid, nitric acid, sulfur, carbon dioxide, ammonium nitrate, dry ice and ammonia.

° ° °

NEW $2.5 MILLION TERMINAL WILL BE BUILT AT ANCHORAGE

Plans have been announced to construct a $2.5 million Union Oil marketing and distribution terminal at Anchorage. Plant and equipment will include new offices, warehouse and garage to replace those damaged by the Good Friday earthquake.

Construction already is underway and will continue into 1965. The Whittier plant, destroyed by fire after the quake, will not be rebuilt.

° ° °

ALTON DISCOVERY MAY BE 2ND FIELD IN AUSTRALIA

We may have a second commercial oil field in Australia. The company has announced a discovery on its large exploratory block in Queensland 54 miles southwest of the Moonie field.

Alton No. 1 well flowed initially at a rate of 1,050 barrels a day of 54-degree gravity oil on a one-hour drill stem test of a 60-foot interval from 6,060 to 6,120 feet. The well was completed from an interval of 6,055 to 6,124 feet flowing at a rate of 480 barrels a day with 207,000 cubic feet a day of gas.

Alton No. 2 was drilled as a confirmation well half a mile northwest of Alton No. 1. The No. 2 well flowed at a rate of 1,535 barrels of clean, 53-degree gravity oil through a half-inch surface choke during a two-and-a-half hour drill-stem test from an interval of 6,089 to 6,102 feet. During the test, it produced gas at a rate of 780,000 cubic feet a day.

A third Alton well will be drilled half a mile south of No. 1.

Union Oil, Kern County Land Co. and Australian Oil & Gas Co. have exploration rights on about 24 million acres surrounding the Moonie and Alton discoveries.

If the Alton strike is large enough to prove commercial, the oil could be shipped to the Moonie field, where it could be pumped through the 190-mile long Moonie pipeline to Brisbane. The Moonie field is now producing about 5,500 barrels of oil a day.

° ° °

UNION OILERS DONATE $6,900 TO ALASKAN RELIEF FUND

A total of 473 Union Oil employees, pensioners and consignees from around the world have donated $6,927.65 to fellow employees in Alaska to help repair damage suffered in the Good Friday earthquake.

Howard Webb, Richard Grocock and Richard Lyon, joint administrators of the Alaska Employees Relief Fund, gave this report of their stewardship:

"Checks were issued to those in

need of immediate assistance; and since then all employees have been compensated for losses involving household effects. This amounted to approximately $4,000.

"We have a remaining balance of approximately $3,000, which is being distributed to cover the expenses of minor structural repairs to chimneys, fireplaces and broken plaster."

Webb, spokesman for the administrators, described reaction of Alaska employees when they learned about the relief fund.

"They were grateful to know this would assist them to recover at least part of their losses," Webb said, "but the realization that fellow Union Oilers wanted to help was a tremendous morale uplift."

Contributions, solicited in a letter sent to all employees, came from many sources. In addition to individuals, the campaign brought group donations from the Credit Card Accounting Department in San Francisco; the Seattle Terminal employees; the Independent Union of Petroleum Workers at Pico Rivera, California; the Glacier Employees Association in Cut Bank, Montana; employees at Union Research Center in Brea, California; the Oil Chemical and Atomic Workers International Union in Rodeo, California; and the Union Service Station Employees Association of California—South and Mid-Coastal Divisions.

Said Webb, "We received checks from Washington, Oregon, California, Idaho, Montana, Nevada, Wyoming, Arizona, New Mexico, Texas, Oklahoma, New York, Louisiana, Washington, D.C., Hawaii, Tokyo, Bangkok and Hong Kong.

"This generous response came not only from employees and employee groups, but from many retirees and Union Oil consignees. Some of the most generous checks were received from Alaska consignees," Webb said.

° ° °

UNOWAX DICER ENHANCES ITS PACKAGING, SALEABILITY

A dicing machine has been added to the Unowax plant at Oleum Refinery. The dicer produces Unowax in small cubes or pellets that are packaged in bags. In the past Unowax was marketed in slabs.

The new dicing equipment not only reduces packaging costs substantially, it also enhances saleability of this space-age product.

Unowax, as you know, consists of blends of paraffin wax and polymers (plastics). It combines the strength and flexibility of plastics with the desirable "flavor barrier" of paraffin wax. This, of course, has been a real boon to what was a declining market throughout the world for pure petroleum wax.

° ° °

UNION OIL SUPPLIES VESSELS OF MEXICAN NAVY ON CRUISE

Like American midshipmen, cadets of the Mexican Naval Academy spend their summer months at sea learning the practical side of their nautical professions.

Early this summer the Mexican Navy training ships *Potosi* and *Queretaro* departed on a 15,000-mile goodwill training cruise of Mediterranean and Atlantic seaports.

Under a world-wide agreement between Union Oil and the Mexican Navy, Union arranges for fuel and petroleum products for Mexican Navy vessels cruising outside of Mexican territorial waters.

During this summer's training cruise the *Potosi* and *Queretaro* were supplied by Union Oil at Naples, Port Said, Lisbon, the Azores and on the East Coast of the United States.

The training cruise was termed a "huge success."

° ° °

MARKETING IS PLEASED WITH 'SPIRIT OF 76' TIRE SALES

Officials in the Marketing Department report they are pleased with the results of the "Spirit of 76" tire promotion launched on June 1.

continued

Loading Union lubricants aboard Mexican naval vessels in Philadelphia.

Business Highlights

continued

"It has proved to be the most successful tire promotion we have had to date," said C. E. (Ted) Rathbone, vice president for marketing.

° ° °

TURBODRILL SAVES MONEY AND TIME AT LAS CIENEGAS FIELD

In the Las Cienegas Field – the Los Angeles oil field with a downtown street address – one big problem is how to drill a dozen wells from a half-acre site. Although the oil formation spreads out a mile or more under homes and businesses, our drilling site is severely restricted in size.

To define the field means the drill must bore down, then angle off sharply to reach its lateral objective. This manner of drilling an off-vertical hole is known as slant drilling, or directional drilling. In the past a device known as the whipstock has been employed to slant the drilling tools in the desired direction. Main problem with the whipstock was that the heavy, wedge-shaped tool had to be pulled up and reset several times to force a gradual turn.

Now enter the turbodrill. Union drilling specialists employed this new tool on 10 holes at the 4th and Washington drill site of the Las Cienegas Field, and the results appear promising.

But first, let's see how it works. The turbodrill utilizes the pressure of mud fluids pumped down the drillpipe to actuate a long, slender turbine at the bottom of the drillpipe. The drillpipe doesn't turn; instead, the fluid-driven, bottom-hole turbine spins the bit at 400 RPM, twice the speed of a rotary turntable.

Here are the results: Instead of 100 feet of hole in 50 hours of whipstocking, the turbodrill bit down 1,100 feet in only 36 hours. Total savings from reduced rig time was something like $100,000 for 10 wells –perhaps even more in the long run.

Besides speed, there are other advantages. If the drill bit is not 100 per cent on course, it is easy to get a turbodrill back in line. This means less hole trouble while drilling, and less chance of casing failure in completed wells. Moreover, the turbodrill is a full-gauge tool; there's no need for a hole-opening run to follow as with the whipstock.

To be sure, more experience is needed. But at this stage, the experience points toward the turbodrill replacing the whipstock in many slant-drilling operations. (76)

° ° °

TONS OF STEEL, INGENUITY USED ON ALASKA TERMINAL

Men, money, ideas and steel all are going into rebuilding the Anchorage Marketing Terminal. When the first requisition for supplies was received, Purchasing Department specialists and our suppliers went into action.

Required were 200 tons of pipe, 58 tons of valves and fittings—more than six railroad carloads. Bids were taken and analyzed, then orders placed with vendors in Pennsylvania, Ohio, Texas, California, Oregon and Washington.

Time was important, but cost wasn't neglected. Ideas saved money. Fifteen tons of valves and fittings were shipped by barge. The heavy materials, however, were shipped by more economical hydrotrain – railroad cars loaded on barges at Seattle, towed to Alaska, offloaded at Whittier, then sent by rail to Anchorage.

In Seattle, hydrotrain shipments were consolidated. To reduce bulk, smaller pipes were slipped inside larger ones. Weld fittings were put into the voids.

The Traffic Department solved some tricky problems too. Several railroad cars were temporarily lost. In another case, one railroad refused to allow two of its cars to be shipped to Alaska.

Finally, 15,000 pounds of miscellaneous building materials were shipped overland by truck on the Alaskan highway.

° ° °

76 PRODUCTS USED TO CLEAR SITE FOR NUCLEAR PLANT

The Southern California Edison Company and the San Diego Gas & Electric Company are jointly constructing a 395,000 kilowatt nuclear generating plant at San Onofre, midway between Los Angeles and San Diego.

To prepare the site for actual plant construction, 1.5 million cubic yards of earth had to be removed from the site. A battery of earthmoving machines – each hauling loads big enough to fill a backyard swimming pool—swarmed over the site in two nine-hour shifts, six days a week, to meet an August deadline.

The contractor, Kirst Construction Co. of Altadena, used Union Oil products for the earthmoving job.

The $82 million nuclear generating plant is expected to go into operation early in 1967.

NUCLEAR GENERATOR: *Earthmoving machines, each hauling enough to fill a backyard swimming pool, were powered by Union fuels during site preparation for plant.*

A Long Right Arm For Pipeline Dispatchers

Operations really began humming when the pipeliners harnessed the electron

UNION OIL CENTER

THE PIPELINE DEPARTMENT'S superintendent of operations, Charles A. Campbell, walked into the Dispatch Center to survey the morning's workload. He picked up a sheaf of reports, noted that refined products were moving north, east and south; heavy crude and cut-back tar were moving toward Santa Maria Refinery; San Joaquin Valley crude and other commodities were being pumped northward to Oleum Refinery.

In the Los Angeles area, there was a storage problem. Los Angeles Refinery's Unit 33, the crude fractionation and thermal cracking plant, was being shut down for a turnaround. Until the unit was back on stream in 14 days, someone would have to find space for an extra 60,000 barrels a day of crude. That someone was the Pipeline Department.

"To complicate matters," Campbell said, "a supertanker was due at Los Angeles Outer Harbor and we had to handle its load."

Sound like chaos? According to Campbell, it was a routine day. A glance around the Dispatch Center wouldn't indicate otherwise. Hardly a sound echoed from the walls. One tipoff of activity was the periodic blinking of lights on a large, green, wall-panel display situated between king-size maps of the Los Angeles basin and the San Joaquin Valley.

Nor were people dashing hither and yon. In the center of the room stood two tables. Each table had a telephone, a supply of sharp pencils, a calculator, several note pads, a stack of hourly gauge reports and the impersonal face of a meter busily clicking off numbers. Ben Airey and Bunny Trout, senior dispatchers, were seated at the tables, speaking quietly into their telephones. Occasionally one would touch a button and a light would blink on the display panel. The appearance was that of an office during the lunch hour.

continued

DISPATCH CENTER: *From this electronic control board in Union Oil Center, two pipeline dispatchers can direct the flow of oil products, both refined and crude, throughout much of California.*

Pipeline *continued*

Unless you were an insider, you might never suspect that Airey and Trout were directing the movement of thousands of barrels of crude oil and refined products all over California. Their long right arm was, of course, behind the green wall-panel that masks an electronic control network of a sort grandfather hardly imagined. The formal name given to this slight-of-hand performance is electronic supervisory control, but in everyday language it's called remote-control dispatching. With no more than a touch of a button, a flick of a switch or, at most, a telephone call, the two dispatchers control the company's entire California pipeline system. To understand the significance of their achievements, let's take a look at the two pipeline divisions.

The main pipeline in the Northern Division begins near Bakersfield, runs northward through the San Joaquin Valley past Coalinga and on to the Oleum Refinery near San Francisco. Upwards of 65,000 barrels of oil will move through this pipeline in one day. A second pipeline jogs off south of Coalinga, crosses the mountains to the Pacific Ocean and terminates at Avila. Northern Division operations are controlled from the Union Oil home office Dispatch Center by "hot line" telephone and remote switching at major pump stations.

It is the Southern Division, however, that has really harnessed the electron. This division serves the Santa Clara River Valley and the greater Los Angeles basin. One pipeline begins at Ventura, connects to the Torrey Pipeline and runs southward to Los Angeles Refinery. Another pipeline begins at Stewart Tank Farm near Research Center and runs through Norwalk to Los Angeles Refinery.

Campbell, pointing to a wall map of the Southern Division, said, "With the exception of the Los Angeles Outer Harbor and the Torrance Tank Farm, the entire Southern Division is operated from this office by electronic control.

"At Stewart, Norwalk, Santa Paula, Piru, Torrey and Santa Maria Stations, all switching and pump control is done by microwave. No station operator need stand by for orders to open a valve or start a pump. We can push a button in this office and gauge a tank fifty miles away." Several Northern Division stations have been converted to remote control too.

"We can even take the temperature of a heavy crude in the Santa Maria Valley," Campbell said, "heat it to make it flow, then pump the warm oil to Santa Maria Refinery—all without moving from this room."

Besides being a long right arm to the dispatchers, this electronic control system is a genuine skeptic—a pipeliner's electronic Perry Mason. Never content to accept a statement at face value, this network of transistors and diodes is constantly double-checking facts to assure everyone—itself included—that the system is fail safe.

Engineers call this built-in skepticism a parity check. To show how it works let's say, for instance, one of the pump stations flashes an alarm at 10:23 on a Sunday night. What takes place is a series of intricately coded electronic impulses, but translated into English here's what it means: (Remember, the pump station is unmanned at this hour.)

Dispatch Center: Calling all stations; does anyone have an alarm?

Pump Station: Hey, man, ring the bell.

Dispatch Center: You signaled that you have an alarm; is this correct?

Pump Station: Like yes, man. Dig me?

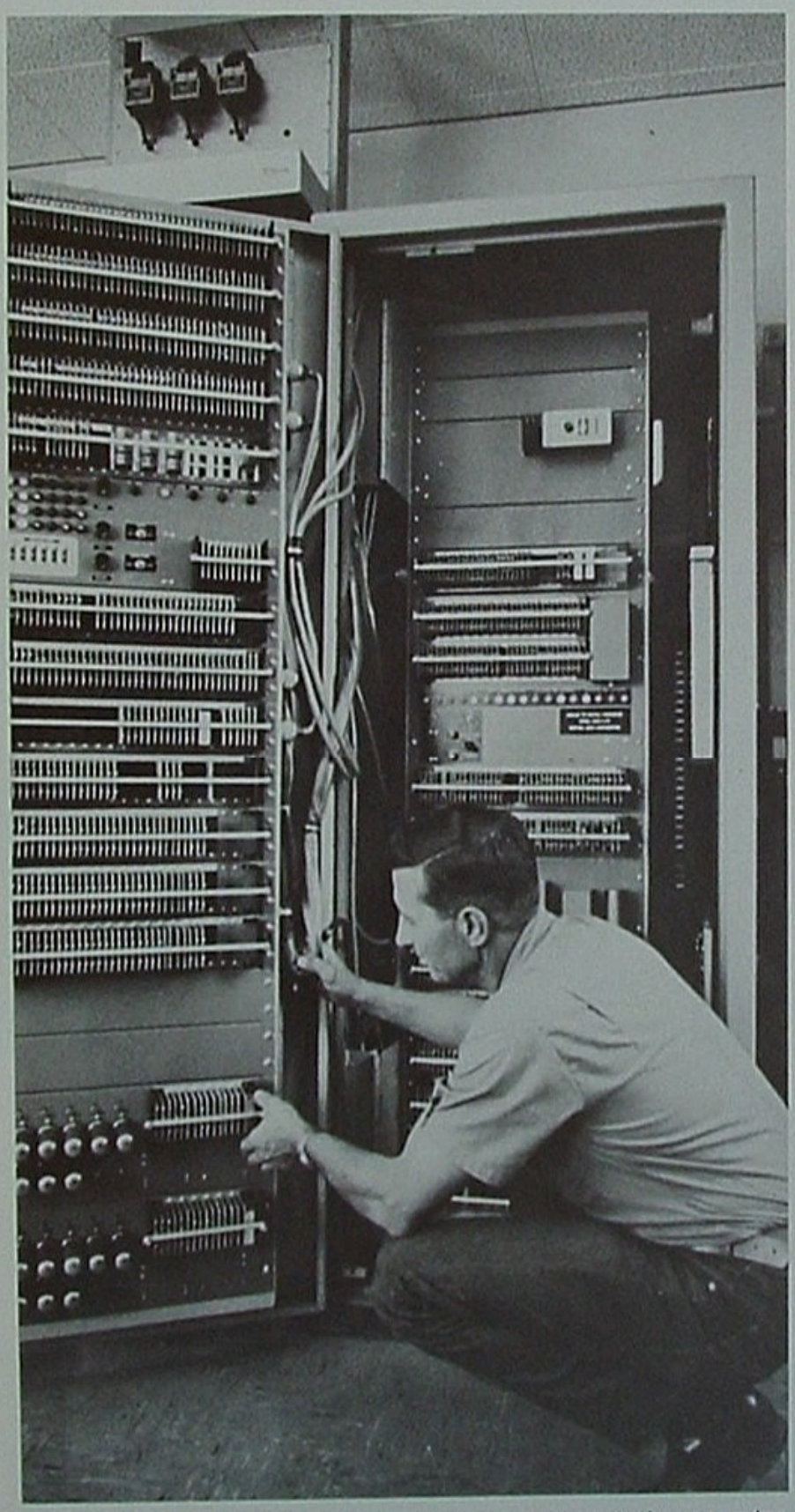
Dispatch Center: Well now, you say you have an alarm; what is the nature of your alarm?

Pump Station: The whoositz on the No. 1 Pump has quit. Call out the Marines.

Dispatch Center: You say the whoositz on the No. 1 Pump has discontinued functioning; is this correct?

Pump Station: Like right, daddy-o. You're on the beam.

Dispatch Center: I shall signal the alarm.



NEW SKILLS: *Until 1960 Bert Adams was a pipeline station operator. Today, as a communications specialist, he helped install the electronic pipeline control equipment shown here at Santa Maria.*

Only a second or two has elapsed; a red light flashes on the green, wall-panel display in Union Oil Center; the night-duty dispatcher acknowledges the alarm and takes steps to correct the trouble.

Sophisticated as electronic dispatching is, this costly gadgetry isn't there simply because Union Oil Company is intrigued by shiny instruments. Dollars-and-cents economics have dictated its installation. John H. White, manager of the Pipeline Department, explains the situation this way:

"For years," he said, "we used steam power to move oil. As these steam plants wore out and it came time to replace them, we had to take a close look at our costs. Electronic control promised greater return on the invested dollar.

"At the same time," he continued, "we see our competitors coming out with newer, more efficient equipment. We are forced to keep pace, else we'd find ourselves priced right out of the market."

What made electronic control practical was the introduction by the Communications Department several years ago of microwave equipment. What once was a small, private telephone system is today a full-scale communications network with telephone, telegraph, telemetering and radio facilities. With microwave telephone and telegraph channels available for pipeline dispatching, it became possible to consolidate all the dispatching chores at Union Oil Center. The next logical step was to mechanize the motor controls at pumping stations and operate remotely from the home office.

The duties of pipeliners took on new character with the switch to automation. Instead of firing heaters and cleaning boilers, pipeliners began working on electric motor controls. A training course was set up under Jack Spaulding, pipeline safety and training supervisor, to teach the pipeliners the intricacies of electric motor control. Sixty-three pipeline employees are now completing a six-month long instrument maintenance course.

"Every man has invested about 100 hours in spare-time studies," Spaulding said.

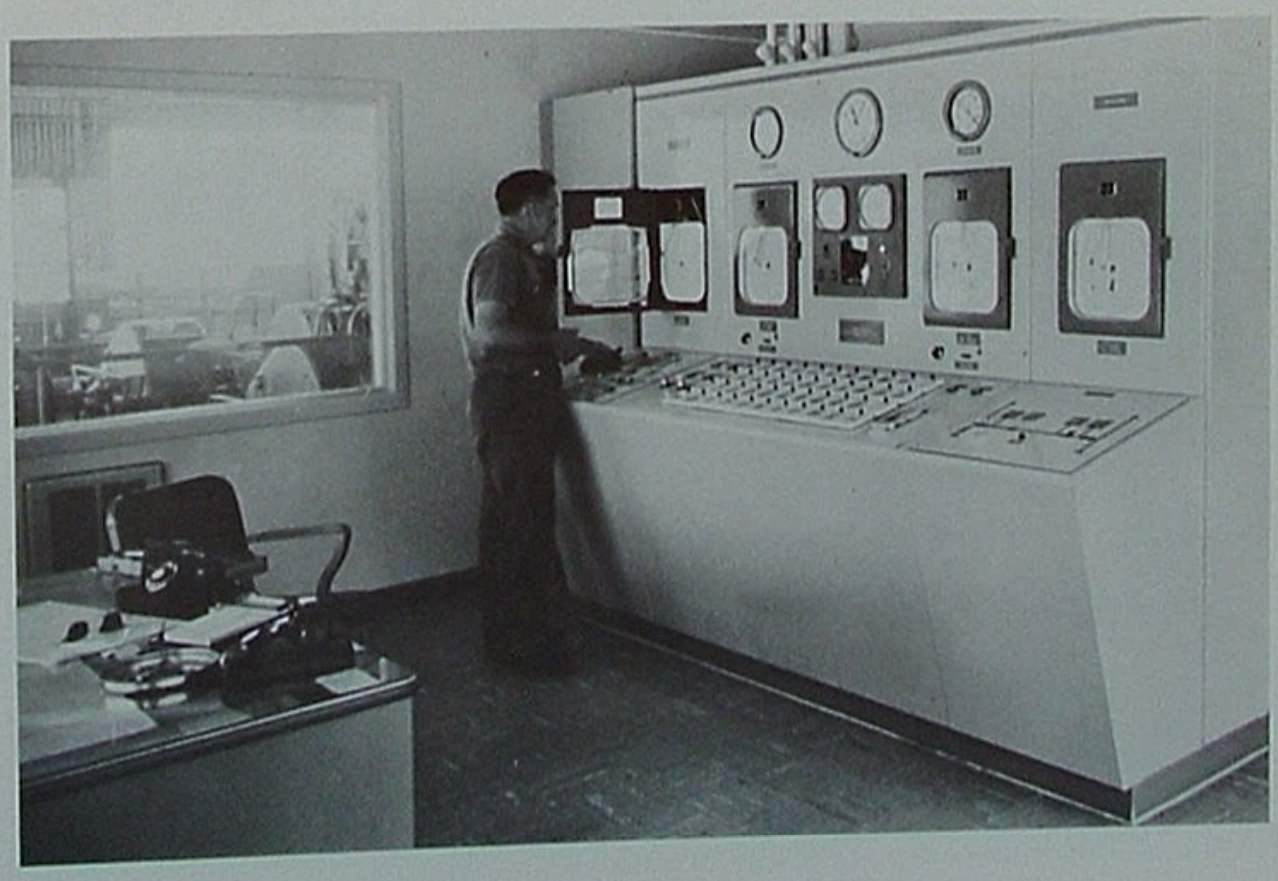
When the steam plant began going the way of the buggy whip, some pipeliners foresaw the change. They recognized that physical skills would one day be replaced by mental skills. Because they looked ahead, eight of the 32 employees in the Communications Department today are former Pipeline boiler washers, utility men, roustabouts, firemen and station operators. Art Youman of Coalinga, Don Gullickson of San Luis Obispo, Bert Adams of Orcutt and Wilbur Barber of Bakersfield are examples.

Their transfers from Pipeline to Communications was no easy matter. Adams and Barber burned the midnight oil for months before qualifying for the stiff entrance exams. Besides attending night school, Barber spent his weekends understudying a communications foreman in the field.

In their new jobs, these men are working at higher skill levels, and at higher pay, than before. Gullickson took specialized electronics studies in Minneapolis and helped train co-workers in the techniques of installing the electronic dispatching system and keeping it humming. Bert Adams was one of the men who installed the Santa Marina Pump Station equipment.

Today you'll find men such as Youman, Gullickson, Adams and Barber working behind those green wall-panel displays—probing electronic circuitry rather than stoking furnaces or washing boilers.

Because they kept pace with progress, they are helping assure Oleum Refinery of its daily quota of San Joaquin crude. Using their new skills, they help dispatchers like Airey and Trout to move cut-back tar to Santa Maria Refinery. Because they have hooked up the right wires behind those green wall-panels, the Pipeline Department can find space for 60,000 barrels of crude a day until Unit 33 is back on stream. And that's why Charlie Campbell can say it's all in a day's work. (76)



PUMPING STATION: *Louis Lebow, senior mechanic, checks recording instruments at Torrey Station. Pumping equipment is linked by microwave with Dispatch Center in home office.*

IN FOCUS

INSPECTION: *Confidence is a salesman's best asset, and here's one salesman of Union Oil lubricants who is reinforcing his confidence. He is Harry Hellmund Jr., head of Hellmund & Co., Elizabeth, New Jersey, pictured with his wife during an inspection tour of Los Angeles Refinery. J. R. Smith, refined-oil blender, explains the workings of the blender.*

A PAIR OF QUEENS

WE GOOFED: *In the June issue we published a short article, with picture, about Marilyn Woody who as Queen for a Day on the Jack Bailey TV program won a trip to Europe. Our article was correct, but the picture was of Mrs. Helen Smith, wife of a Union Oil Minute Man employed at Redondo Beach. Mrs. Smith was also crowned Queen for a Day on the Bailey show. To set the record straight, we present Mrs. Smith, at left, as she appeared during the coronation. In the right photo, Marilyn Woody with her Union Oiler husband, Richard Woody, are shown enjoying Paris. This isn't the first time we've had trouble with a pair of queens.*

NEW OFFICERS: *The Union Oil Girls' Club has elected a new slate of officers for the coming year. Pictured at the 36th annual June Luncheon held at the Beverly Hills Hotel, they include (L-R) Lillian Sciaraffa of R&M Accounting, president; Louise Tulley of R&M Accounting, vice president; Bernice Willis of Refining Department, recording secretary; Marjorie Pew of E&P Accounting, treasurer, and Helen Crowell of Payroll, corresponding secretary. Lois Conley of E&P Accounting, elected assistant treasurer, was not present at picture taking.*

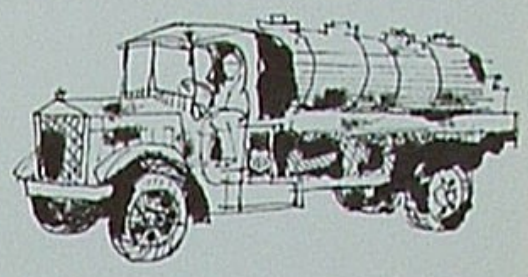
HAWAII: *Gregory Silva, vice president of sales for UJACO Hawaii, a Union sponsored activity for neophyte businessmen, was named Mr. Junior Achievement for 1964. With him is Eileen O'Connell, winner of the 1964 Miss JA award.*

PHOENIX: *Bob Swan, son of senior analyst Charles L. Swan, was elected as Boys' State Governor of Arizona, an office created by an American Legion citizenship training program at Arizona State. Bob, a class officer in his first three years at Coronado High in Scottsdale, steps up to student body president this fall.*

SEATTLE: *Carol Jaenson, granddaughter of auditor Burr Chandler, and an honor graduate of Roosevelt High, will attend Lewis & Clark College, Portland, on a scholarship that provides a six-month study assignment in foreign relations in France.*

AUBURN, WASHINGTON: *Ronald Roberts, son of consignee L. C. Roberts, was declared winner of the 29th annual University Legal Argumentation held at the Spokane County Court House. Ron, president of his senior class, was graduated at the head of his class at the Gonzaga University School of Law.*

TURNING BACK THE PAGES



THE SHIP THAT RAN INTO ITSELF

THE SECOND DECADE of this century saw California become the leading oil state in the nation. As that decade dawned, Union Oil Company, then just two decades old, was fighting to keep its position in the field and marketplace.

Early in 1910 the company finished a 240-mile-long, eight-inch pipeline from the San Joaquin Valley oil fields across the Santa Lucia Mountains to tidewater at Avila. Thanks to the pipeline, Union acquired an extra 30,000 barrels a day of crude, doubling the amount of oil available to the company.

° ° °

ANTICIPATING INCREASED production, the company a few years earlier had bought two sister ships, the *Santa Maria* and the *Santa Rita*. Each was capable of carrying 55,000 barrels of oil — a large capacity for those days. There was one problem: Both ships were operating in the Great Lakes. To get them out of the lakes, through the locks and down to sea, the vessels were cut in half, then sealed with bulkheads. In the move through the locks, the stern of each tanker towed the forward section to the Atlantic waters.

The *Santa Maria* negotiated the locks successfully, but the *Santa Rita* stopped too suddenly in one lock and the bow plowed into the stern. Fortunately, the *Santa Rita* didn't sink. Patched up, she reached the Atlantic with the *Santa Maria;* both ships were converted into tankers, sailed around the horn and joined company service.

After delivering millions of barrels of crude and refined products, the *Santa Maria* and *Santa Rita* were sold. During World War II they were lost at sea. But for the *Sant Rita's* remaining lifetime, she had been known as "the ship that ran into herself."

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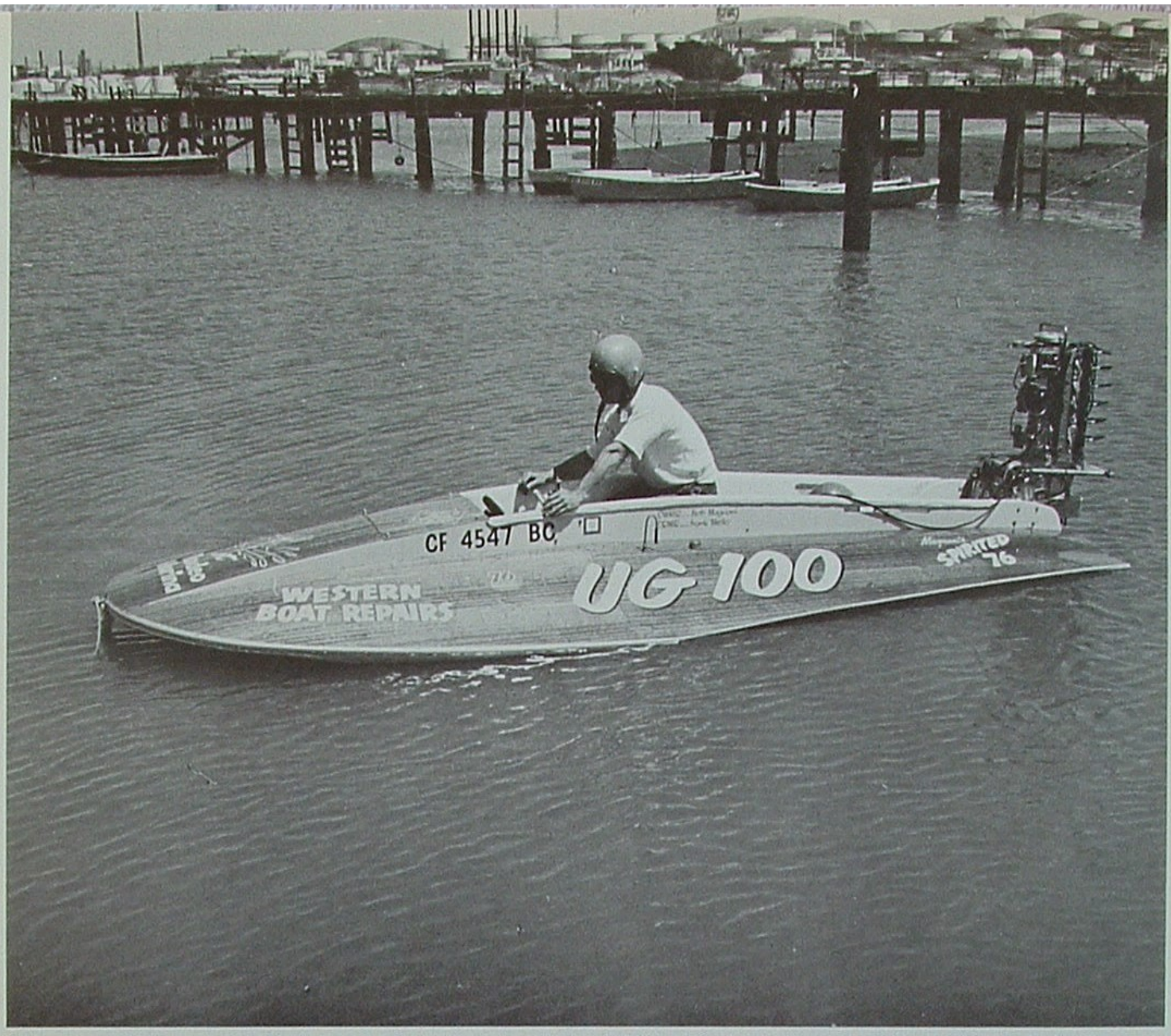
SEQUEL: The *Santa Maria* No. 2, acquired in 1922, was sold in 1941. The *Santa Maria* No. 3, launched June 12, 1952, recently completed its 349th voyage and has delivered an estimated 43 million barrels of petroleum products in service on the West Coast. There have been no subsequent *Santa Ritas.* (76)



Driver Frank Mello poses in Bob Magnani's 100 mile an hour "Spirited 76" at Rodeo Marina. Our Oleum Refinery is in background.

Magnani's 'SPIRITED 76'

RODEO, CALIFORNIA

ONE OF THE *hottest* hydroplanes in the West is an amazing little flying saucer labeled Magnani's "Spirited 76." It was built within a hop-skip-and-jump of our Oleum Refinery in the shops of Western Boat Repairs. It is based at Rodeo Marina, same location, owned by Carl Bennett, an enthusiastic distributor of Union's marine fuel and lubricants. Owner of the swift craft is Bob Magnani. The driver is Frank Mello.

Designed for marathon racing, which means distances of 50 miles and up, the "Spirited 76" got off to a perfect beginning during the 1963 racing season. It won four consecutive races, averaged over 90 miles an hour, never once faltered under the urge of an open throttle.

Driver Mello and his mechanics credit much of the boat's speed and consistent performance over long distances to 76 Outboard Fuel. Being a pre-mix of Union's Aviation Gasoline with Union Outboard Motor Oil, this product has practically put an end to do-it-yourself mixing of outboard fuel. More important, boat operators are finding its quality and stability their *Finest* guarantee of top outboard performance and engine life under all varieties of operation. It was the West's first pre-mix to be approved by Kiekhaefer Corporation, manufacturers of Mercury Outboards.

Those fuel qualities, to Frank Mello also, mean gum-free carburetors, clean spark plugs, free-flexing piston rings, maximum performance from dozens of other engine parts — even though the race consumes hours and the "Spirited 76" is flying with wide-open throttle at 100 miles an hour.

Trail-Blazing Truck Driver

PORTLAND, OREGON

WHEN MRS. DONALD E. RATLIFF of Salem, Oregon, was driving to Bend recently to visit her father who was ill, she encountered a snowstorm in the Santiam Pass of the Cascade Mountains.

Union Oil transport driver William F. Claflin of the Portland Terminal was driving along the same route and spotted Mrs. Ratliff. Claflin stopped and helped her install chains. What's more, he ordered her to "follow me" and proceeded to break trail with the big truck until they reached safe driving across the pass.

Mrs. Ratliff, grateful for the roadside courtesy, wrote a thank-you letter to terminal superintendent Ralph Cairney in Portland. Said the Salem woman: "A more courteous or helpful person cannot be found." 76

Quick action saves a life in Alaskan

Motor Boat Accident

KETCHIKAN, ALASKA

ON THE MORNING of July 14 at the Ketchikan Marketing Station, Union Oiler Kent Dowse was riding in his motor boat near the Union Oil dock on the Tongass Narrows. The craft was traveling about 30 mph when the control handle of the outboard motor jerked from his hand. The boat turned sharply, throwing him into the water.

Back on shore in the office, Plant Superintendent Kenneth Lea and driver G. R. Rydeen were alerted by the shouts of a local maintenance man. They ran to the dock, boarded Lea's boat, and sped to the scene.

Dowse's boat, meanwhile, had been circling—passing over the unfortunate swimmer on each circle. Although Dowse is a good swimmer, he was exhausted from diving each time the boat passed over.

As Lea and Rydeen arrived, the motor quit, allowing them to approach. Lea grabbed a clam rake and hooked the exhausted Dowse, who was sinking. The two rescuers pulled Dowse into the boat, returned to shore and took the man home.

In reviewing the accident, the Coast Guard exonerated Dowse of any negligence in operating his boat. Sales Supervisor W. E. Butts had this to say about Lea and Rydeen, "They deserve commendation for their quick thinking and action. I feel it prevented a certain drowning."

As for Kent Dowse, now recovered, he's had enough action in recent months to satisfy anyone. During the Good Friday earthquake last March, he and his wife were trapped inside a company house at the Whittier Terminal. After a giant, earthquake-triggered sea wave had inundated the area and was partly subsiding, Dowse escaped from the building carrying his wife and wading waist deep through swirling water and oil. 76

Crooked Horn becomes a trophy

CRESWELL, OREGON

ADELINE HOLLEMON is the wife of Clyde C. Hollemon, Union Oil dealer and mayor of Creswell, Oregon. Adeline regards herself as an accomplished huntswoman, and no wonder. At one time or another, she has shot deer, elk, moose, ram and two grizzly bears—one of the latter in self defense.

Not long ago Mrs. Hollemon was glancing through a past issue of *Outdoor Life* magazine and came across an article by field editor Charles Elliot, who described a hunt in central Wyoming where he had sought, unsuccessfully, an antelope called Crooked Horn. The wary animal had eluded the sights of the best hunters and was becoming a local legend.

When Adeline Hollemon read the article, she laughed and called her husband. You see, she had bagged Crooked Horn. Mrs. Holleman wrote of her exploit; her story was published by *Outdoor Life* and she is receiving fan mail from envious hunters throughout the country.

Incidentally, out of hunting season Mrs. Hollemon is an artist, folk singer and pianist. 76

Adeline Hollemon and Crooked Horn

SERVICE EMBLEM AWARDS

CORPORATE STAFF

September 1964

45 YEARS

LYMAN E. LIMBOCKER ..... Union Oil Center

35 YEARS

GRANT A. BENHAM ..... Research Center

20 YEARS

ANNA V. ADDY ..... Research Center
NORMAN C. CH'IN ..... Research Center
JAMES L. LAFFERTY ..... Research Center
FRANCIS S. LIGGETT ..... Research Center
JAMES W. WILSON ..... Research Center

15 YEARS

CHARLES J. WELSH ..... Research Center

10 YEARS

FLOYD M. LOWE ..... Research Center
DOROTHY V. STANLEY ..... Union Oil Center

EXPLORATION & PRODUCTION

September 1964

45 YEARS

WILLIAM O. BUTLER ..... Union Oil Center

30 YEARS

F. C. CHEESEBROUGH ..... Taft, California
EWING W. HICKS ..... Cat Canyon, California
JERRY I. HOCKENBERRY .. Dominguez, California
MARION D. STEELE ..... Brea, California

20 YEARS

MIKE M. BIEL ..... Brea, California
ALFONSO CHAVEZ ..... Santa Maria, California
JAMES R. SALVAGE ..... Del Valle, California

15 YEARS

HOYLE A. DIXON ..... Coalinga Nose, California
ROBERT P. MARTENS ..... Lompoc, California
ROBERT G. SMITH .. Santa Fe Springs, California
JOSEPH W. WARDELL ..... Houston, Texas
R. W. YARBROUGH .. Santa Fe Springs, California

10 YEARS

ROBERT H. ANDREWS ..... Brea, California
JACK L. SLATER ..... Coalinga Nose, California

REFINING & MARKETING

September 1964

40 YEARS

HERBERT C. DUNN
San Luis Obispo Tank Farm, California

35 YEARS

FRED W. OLSNESS—August Spokane, Washington
M. G. ORDRONNEAU .... Los Angeles, California
ROBERT H. PATTERSON ..... Oleum Refinery
DONALD A. SOGARD—August Santa Maria Refinery
ROY J. WILLS ..... Los Angeles Refinery

30 YEARS

JOHN A. LIVINGSTON ..... Oleum Refinery
GILBERT W. MELDRUM ... Edmonds, Washington
JOHN W. NORTON ..... Union Oil Center
L. E. WOODLEY ..... Los Angeles, California

25 YEARS

LAWRENCE CAMBRA ..... San Jose, California
WILLIAM M. TUFTS ..... Eugene, Oregon

20 YEARS

TRUMAN H. ADAMS ..... Sacramento, California
WILLIAM L. BUDDE ..... Oleum Refinery
MAURICE L. CROWE ..... Portland, Oregon
ALEX LOHSE ..... Union Oil Center
FRANCIS J. MULRONEY .. Hoquiam, Washington
JACK C. PIETERICK ..... Oleum Refinery
JAMES E. RIOU ..... Los Angeles Refinery
JOHN D. SCHULZ ..... Union Oil Center
MARY S. STORNI ..... San Francisco, California
ELDEN H. TURNER ..... Santa Maria Refinery

15 YEARS

EDWIN L. HALL ..... Cut Bank Refinery
HELEN B. HOFF ..... Union Oil Center
LEE J. PHILLIPS ..... Oleum Refinery
ARTHUR R. SMITH ..... Pendleton, Oregon
JOSEPHINE A. WILKIN ..... Union Oil Center

10 YEARS

KENNETH E. BROWN ..... Cut Bank Refinery
FRANK G. PIERCE ..... Union Oil Center
LAWRENCE R. ROWLAND .. Los Angeles Refinery
ROBERT E. SMITH ..... Fresno, California
LEO WALVATNE ..... Edmonds, Washington

DEALERS

September 1964

30 YEARS

T. E. SCHWARZ ..... Aberdeen, Washington

25 YEARS

GRANT DENNIS ..... Santa Monica, California
E. J. DIETRICH dba IRVINE SERVICE STATION
Irvine, California
E. V. MUELLER ..... Burbank, California

20 YEARS

F. P. KEATING ..... San Diego, California

15 YEARS

BEVERLY-WILSHIRE HOTEL GARAGE
Beverly Hills, California
JOHN C. HANEY ..... Bend, Oregon
E. D. HELLAR ..... Truckee, California
JESSIE HELLAR ..... Truckee, California
ELTON McCORMICK ..... Parma, Idaho
DONALD W. RICE ..... Dairy, Oregon
KENNETH L. SIMPSON .... Redlands, California
SIDNEY STEVENS ..... Los Angeles, California
R. GRANT WOODS ..... Thatcher, Arizona

10 YEARS

HARVEY L. BOLTON ..... Monrovia, California
A. W. BROCKMAN ..... Bishop, California
A. T. NORRIS ..... Talent, Oregon
CARL W. PETERSON .... Joshua Tree, California
WILLIAM H. SPRADLIN .... San Diego, California
JAMES M. TANAKA ..... Berkeley, California

5 YEARS

R. W. BELL ..... Independence, California
W. A. BURROWS ..... El Toro, California
FITZPATRICK CHEVROLET, INC.
Concord, California
WILLIAM HOFFER ..... Raymond, Washington
ROBERT HOFFER ..... Raymond, Washington
WILLIAM MATSON ..... Toledo, Washington
HERBERT E. OTTERSON .... Oakland, California
EINO E. ROVA ..... Sacramento, California
WATSON M. TOMERLIN .... San Manuel, Arizona
DALE A. URBAN ..... Vancouver, Washington
JAMES VILLATA dba SEATTLE PARKING
& STORAGE ..... Seattle, Washington
DALE WRIGHT ..... Alhambra, California
RON YOUNG ..... Santa Monica, California

CONSIGNEES-DISTRIBUTORS

September 1964

30 YEARS

O. W. RUSSELL ..... Firebaugh, California

25 YEARS

E. J. DIETRICH ..... Irvine, California

20 YEARS

JOHN McNAUGHT UNION SERVICE
Great Falls, Montana

15 YEARS

W. L. ROGERS ..... Kendrick, Idaho

RETIREMENTS

August 1964

BURTON CHATHAM
Union Oil Center ..... November 16, 1925
HARVEY P. EYE
Oleum Refinery ..... December 23, 1924
ERNEST C. FAUSSET
Oleum Refinery ..... May 25, 1925
THOMAS E. KILLELEA
Oleum Refinery ..... October 22, 1933
MAX M. NELSON
Los Angeles Refinery ..... May 26, 1927
PAUL A. WILSON
Santa Paula, California ..... August 4, 1928

IN MEMORIAM

Employees:

ANGELO G. BANDUCCI
Oakland, California ..... June 25, 1964
GARRETT WARD CASEY
Compton, California ..... June 25, 1964
GENE S. EYLAR
Long Beach, California ..... July 17, 1964
ERNEST J. MARTI
Houston, Texas ..... June 22, 1964
WILBUR ROSS
Whittier, California ..... June 27, 1964

Retirees:

EDWARD F. BELLINA
Hayward, California ..... July 11, 1964
MAYNARD B. DRIESBACH
Long Beach, California ..... June 28, 1964
JOHN W. JACKSON
Long Beach, California ..... July 10, 1964
ELMO KIRKPATRICK
Eugene, Oregon ..... June 12, 1964
CHARLES E. REID
Rosemead, California ..... June 12, 1964

How many times will you vote today?

UNDER our American *political* system you get a chance to vote in our national elections every two years. Under our American *economic* system you vote many times *each day* — every time you make a purchase.

No one can calculate the number of individual purchases—from groceries to gasoline—that are made in this country each day. But we know they must far exceed 700 million. (By contrast, even an election as vital as our presidential election is expected to draw less than 70 million votes this year.)

This infinitely complex process of voting — by buying or not buying the goods and services offered in our free market — is a wonderfully democratic mechanism. It continually registers the ever-changing needs and wishes of all the people in the country — directing what should be produced, at what price, and in what quantities.

The curling iron gives way to the home permanent; the celluloid collar is replaced by the wash-and-wear shirt; not because of any governmental edict, but simply because the American people "vote" them in and out of existence.

Ironically, communism and socialism — which purport to be "economic systems of the masses"— are the least democratic of all. The people have little opportunity to "vote" on what they want. Instead, a central authority determines for them what shall be produced, how much, and where it will be distributed.

In this country the "private segment" of our economy (which accounts for 4/5 of our Gross National Product) is literally and truly directed by the "votes" of the people. For that reason U.S. capitalism is the most democratic institution the world has ever known.

UNION OIL COMPANY OF CALIFORNIA 76 UNION

REFINERS OF THE WEST'S MOST POWERFUL GASOLINES

This advertisement appeared in: Look, U.S. News & World Report, Business Week, Forbes Magazine, Barron's Weekly, Magazine of Wall Street, Financial World, Commercial & Financial Chronicle, Financial Analysts Journal, Poor's Register of Directors & Executives, Arizona Farmer-Ranchman, California Farmer, Farm Journal, California Farm Bureau Monthly, Oregon Farmer, Washington Farmer, plus other magazines and newspapers.

UNION OIL COMPANY OF CALIFORNIA
P. O. Box 7600
Los Angeles 54, California

How We Work ...

Before our drillers venture into new territory to search for oil and gas, they must first be certain we have title to the land or its mineral rights. When landmen Stanley Waggoner (L) and Roy Martens of Sacramento sought leases in the delta area, they searched out land titles dating back to a Mexican land grant for the 35,000 acre El Rancho Pescadero. Gift deeded in 1843 to Antonio M. Pico by Manuel Micheltorena, Mexican governor of California, the land was sold in 1852 to John C. Fremont, the California pathfinder. After tracing titles to present owners, the land men were able to lease it for prospecting. They also secured leases in the Dutch Slough Field, which already has resulted in three good gas wells for Union Oil Company of California.