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ETHYL NEWS INDEX—1959

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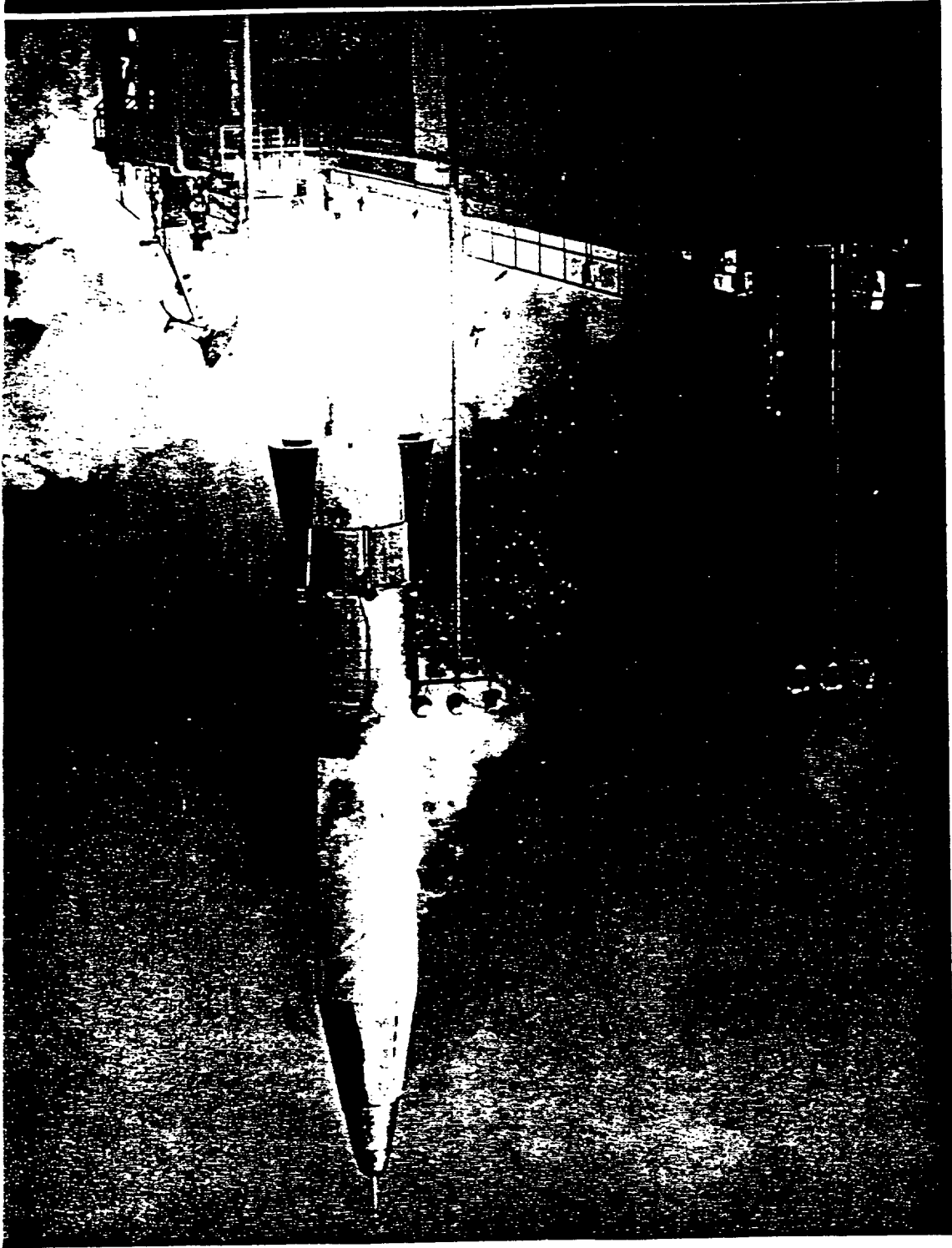
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ETHYL NEWS



FLASH OF POWER THAT CASTS A greenish pall over the night sky, an Air Force Atlas missile blasts off from its Cape Canaveral launching pad. It takes big-company finances, research, plants and manpower to build such elaborate defense weapons (pages 1-5), and advanced fuels and engines to propel them (pages 14-18).

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The Real Dimensions of Business

by B. B. Turner
President, Ethyl Corporation

WHEN ABRAHAM LINCOLN was getting a start in politics, an opponent once tried to embarrass him with the question, "How long should a man's legs be?" Lincoln replied good-humoredly, "Long enough," Lincoln replied good-humoredly, "to reach the ground." Today, more than a century later, some of Lincoln's common sense may be what is needed to widen understanding of the role of "Big Business" in America. Such frequently-asked questions as: "Aren't some of our businesses getting too large? Isn't big business bad for the country? How big should companies get, anyway?" are evidence that many people

Every company has a job to do
and its size depends on the task
it is expected to accomplish for
customers, employees and owners



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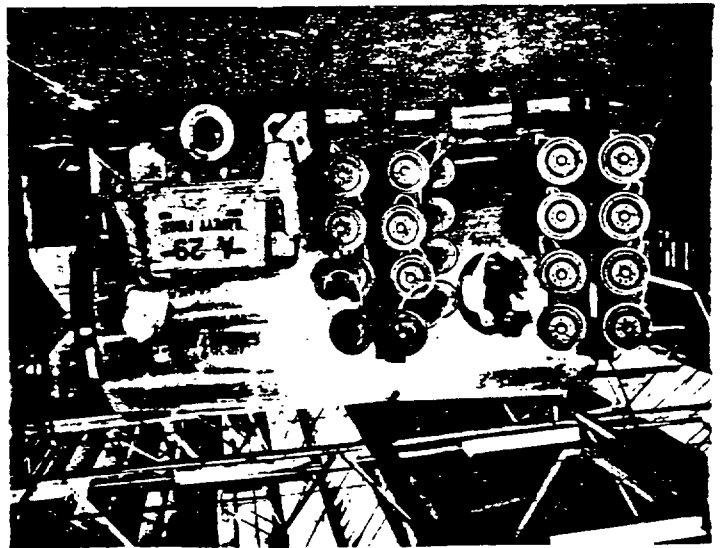
Now, with the dawning of the space age, new challenges arise. The nation is faced with demands for rockets and missiles; for rapid progress in developing nuclear energy; for stepped-up research in jet travel and interplanetary exploration. When the chips are down, it is big companies, fortified with financial resources, skilled men and well-equipped plants, that can tackle and accomplish these challenging tasks. The people of America have come to expect the

New Challenges Arise

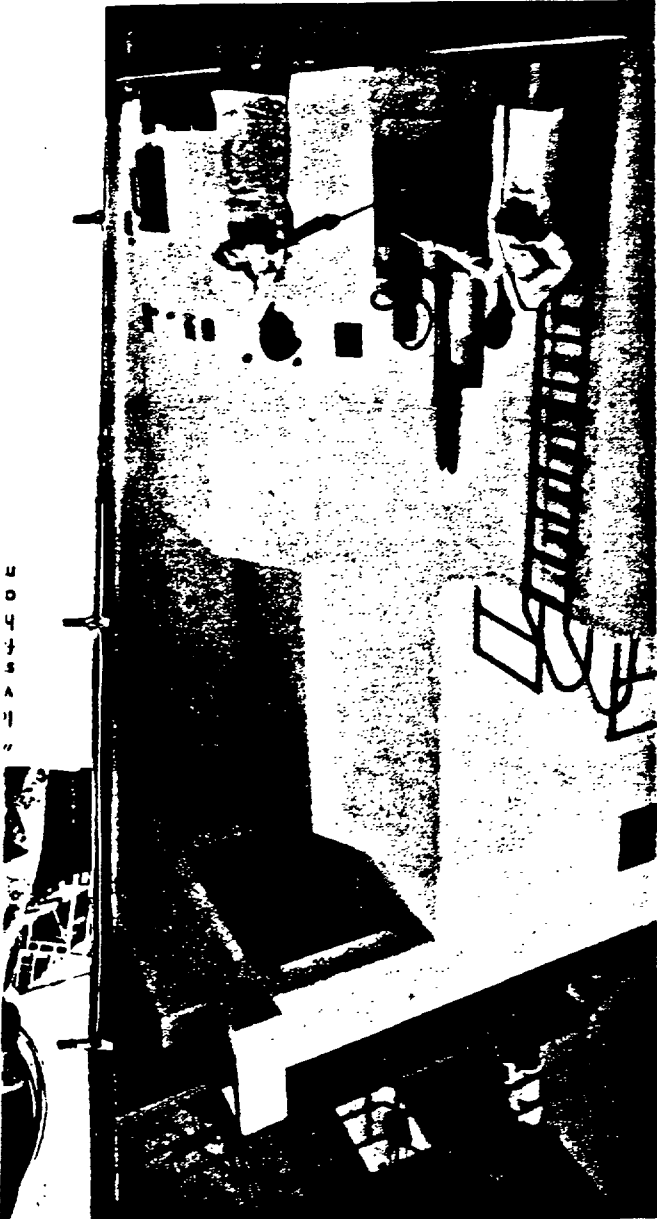
Americans should have learned that lesson from the experiences of World War II. It was the big companies, capable of converting their plants quickly to war production, that took the lead in producing the planes, tanks, guns, munitions and other essential goods that assured our national survival.

The answers can be boiled down to just the sort of reply Lincoln gave his questioner: Every business has a job to do, and the size of a company depends on the task it's expected to accomplish. The legs a business stands on, in other words, must be long enough for it to do a good job for its customers, its employees and its owners. Bigness comes in the areas where there are giant tasks to be done, requiring the investment of huge sums of money.

don't appreciate the role of larger companies in our economy and society.

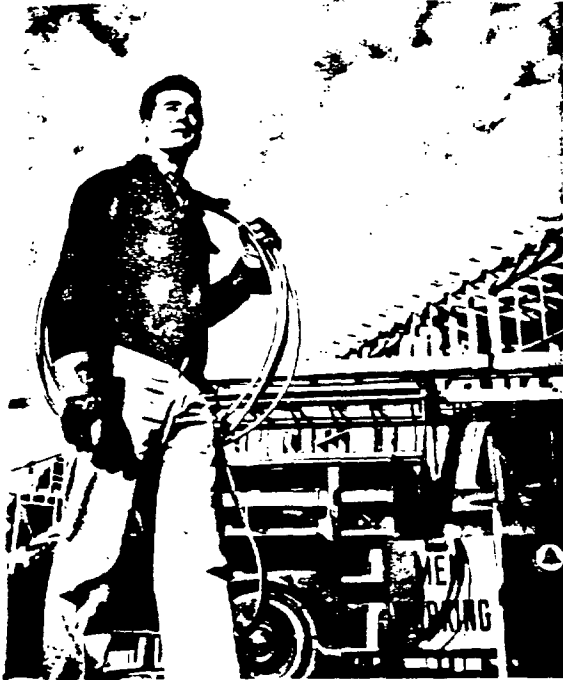


"The nation is faced with demands . . . for rapid progress in developing nuclear energy . . . When the chips are down, it is the big companies . . . that can tackle and accomplish these challenging tasks."



"It was the big companies, capable of converting their plants quickly to war production, that took the lead in producing the planes, tanks . . . and other goods that assured our national survival."

The Real Dimensions of Business



"The people of America have come to expect the larger business concerns to take the lead . . . in providing the products essential to our steadily rising standard of living. This requires continual spending for new tools and equipment . . . Such spending . . . has . . . brought a continual increase in output among workers in industry, permitting higher wages, more leisure and extra job benefits."

larger business concerns to take the lead, too, in providing the products essential to our steadily-rising standard of living. This requires continual spending for new tools and equipment.

Since the end of World War II, for example, General Motors Corporation has invested more than \$5 billion in plant modernization and new machinery and facilities. American Telephone and Telegraph Company—the nation's biggest business in terms of assets—has put more than \$13 billion into improving, expanding and modernizing telephone service and equipment over the past decade.

Such spending by the big business concerns has helped build America's prosperity. It has brought a continual increase in output among workers in industry, permitting higher wages, more leisure, and extra job benefits.

But of course there are far more small companies than large ones. Out of more than 4,300,000 business firms in the United States, fewer than 3,600—one-tenth of one percent—are "big" in the sense of employing more than 1,000 workers.

What about the oft-repeated charge that big corporations are forcing the "little fellows" out of business? Official government figures disprove that theory.

Of all the businesses that have been started since



The Real Dimensions of Business

the end of World War II, the large majority have fewer than 100 employees. Total employment in small concerns has increased by 55 percent since 1945. A special Cabinet committee appointed by President Eisenhower to study the problems of small business concluded, in its majority report, that there is no evidence that small business is being driven to the wall by pressure from big companies.

Companies Mutually Dependent

The truth is that big and little companies in our business system are mutually dependent. All across the country, countless small suppliers are kept busy making parts for, or furnishing service to, big concerns—or processing, converting and distributing the products of large companies. The big firms concentrate on volume production and large-scale research and development.

General Electric Company, for instance, buys from more than 40,000 separate small businesses. The domestic affiliates of Standard Oil Company (New Jersey) in a recent typical year spent close to \$500 million for goods and services in the United States. They were supplied by more than 26,000 separate companies, 75 percent of which employ less than 500 people.

"All across the country, countless small suppliers are kept busy making parts for . . . big concerns."



Sears, Roebuck & Company has 20,000 manufacturers furnishing the products it sells. A Sears executive comments, "We prefer to work with smaller factories; they concentrate on production and look to us for much of their distribution."

Research, another contribution of larger companies, benefits the whole country as it leads to new products, new processes, new advances in science and in health.

According to the National Science Foundation, only 10 percent of smaller manufacturers—those with less than 500 employees—have a research program. But 95 percent of all larger companies—those with 5,000 or more people on their payroll—are engaged in research. The large companies account for only 40 percent of manufacturing jobs, but do 72 percent of all industrial research and development.

Widespread Benefits

New products, launched as a result of the research and engineering program of one particular company, spread out to benefit scores of other businesses and thousands of individual workers. For example, electric food waste disposers were largely developed by a single manufacturer; now 18 companies are making them, buying materials and services from hundreds of different suppliers.

The mere fact that a company grows big is no assurance that it will remain that way. A recent study by the First National City Bank of New York shows that of the 100 largest U. S. companies in 1926, fewer than 60 are on a similar list today.

Newcomers to the list are in industries that have grown rapidly in the past three decades. Among the additions are seven aircraft manufacturers, six electrical and other equipment producers, five petroleum companies, four chemical processors and three makers of synthetic yarns, or mills using all the available textile fibers.

"The American people themselves," says Roger M. Blough, board chairman of United States Steel Corporation, "by their actions as consumers, investors and workers—have created business units of every size and type which are designed to meet the needs and wants of our people. By simply withholding their patronage, their investment, or their services, the people can regulate—or even destroy—their handiwork as their changing expectations require."

The larger and more successful a company be-



"Research, another contribution of larger companies . . . leads to new products, new processes and new advances in science and in health."

comes, the more money it is likely to earn, and the more it must pay in taxes. The big corporations pay out 52 percent of their earnings to the federal government in corporate taxes. In recent years, the record shows, more than half of all the federal income taxes collected from business corporations have been paid by fewer than one percent of the companies. Only by being efficient and successful, do business concerns have funds left after taxes for re-investment, for modernizing and replacing machinery, plants and equipment, and for paying dividends to stockholders.

Broad Stock Ownership

Who are the owners of today's big companies? The man who thinks of corporate ownership in terms of a plutocratic figure in frock coat and striped trousers is far behind the times. Most of the owners of today's big companies are small shareholders.

The New York Stock Exchange, after a recent survey, reported that almost two-thirds of the people who own shares in publicly-held corporations are in households where the family income is less than \$7,500 a year.

In addition to the individuals who own stock in their own names, the biggest companies—known

as the "blue chips" of American industry—can count as part owners many of the nation's colleges and universities, hospitals, churches, charitable institutions and insurance companies. Such "institutional investors" depend on the dividends they get from the big, successful enterprises for part of their income.

The big companies have taken the lead in trying to be good citizens of the communities where they have plants and offices and factories. They take pride in maintaining attractive buildings, well-landscaped grounds, convenient parking lots. Many contribute to educational, scientific, health and welfare organizations.

Today, even the giant enterprises tend to shrink in relative size as American industry, with almost boundless vitality, grows in size and diversity. The nation's population, soaring toward the 200-million mark, is creating demand for new products, and opening new markets for businesses of all sizes.

Businesses of All Sizes

One big steel company fifty years ago made almost 70 percent of all the steel produced in the U. S. Today, though it has increased its capacity four-fold, it makes only 30 percent of the nation's steel. Other firms have grown, prospered, and taken over part of the business.

In the same way, a major oil company has doubled its total output in the past ten years; yet it still accounts for about the same percentage of the free world's petroleum business as a decade ago, because the whole market has expanded over the years.

Thus, in a growing America, there is a place for businesses of all sizes, and tasks for the giant corporations as well as the smaller enterprises. "In this day and age," one executive has remarked, "a large company differs from a small one mainly in the fact that a big firm has more people and more diversified talents than a small one. They are the same kind of people, motivated in the same way, with the same strength, weaknesses, hopes, fears, likes and dislikes."

Professor Sumner Slichter of Harvard has summed it up in another way: "Large enterprises, far from being a menace, will to a growing extent be the instruments by which the country is given the benefit of large-scale technological research and of increasingly vigorous competition." #

"DANGER! WATER!"

Motion picture shows how to eliminate hazards in refinery process systems

by George H. Unzelman

THE HAZARDS OF WATER in process systems, a constant threat to refinery personnel and equipment, is the subject of "Danger! Water!," a new safety motion picture produced by Ethyl Corporation as a service to the oil industry. Filmed in full color during actual refinery operations and with laboratory demonstrations and animated sequences, the movie is designed for showing to management, engineers, operators and safety men alike.

The film's importance is based on its treatment of a problem that is widely recognized, yet one which must be constantly reviewed—the accidental introduction of water into hot oil. When this takes place in an enclosed space such as a fractionating tower or reactor, the resulting steam will vent through any opening with tremendous force. When normal lines cannot handle the volume, equipment fails. Damage can range from an operational upset to ruptured equipment and costly shutdown.

Violent Explosion

One such accident took the lives of two refinery workers. A paraffin distillate exchanger was not completely drained prior to start-up. About five gallons of water mixed with hot oil and caused a violent explosion.

The introduction of water into hot viscous oil in a storage tank can cause a costly, messy and dangerous "foam over." In such a case, water is instantly converted to steam which bubbles through the oil, forming a froth. This froth escapes through vents or ruptures the tank to release the pressure.

Tanks have been known to foam over until almost completely empty.

Still another hazard is from the extreme danger of fire when hot hydrocarbons are exposed to the atmosphere. Such accidents have caused some of the most costly refinery fires on record.

In demonstrating these various problems, "Danger! Water!" starts with animated sequences. These show the tremendous volume increase—1,600 times—when water is changed to steam. Filmed laboratory demonstrations picture the effect of suddenly introducing water into hot oil. These are followed by several actual case histories showing the disastrous results when this accidentally takes place in a refinery process vessel. Animation helps the viewer to understand what happens inside the equipment.

Start-Up Hazards

Since water generally accumulates in process units during a shut-down, the greatest hazard is during the initial phases of a start-up. The viewer is taken through a typical start-up procedure on a catalytic cracker and shown the steps taken to expel water and put the unit on stream safely.

One effective control room scene shows the operator taking action to control the unit as the charge stock suddenly carries small amounts of water into the system, setting off the alarm system.

A tour through a tank farm points out the precautionary procedures to be taken in this area of a refinery. The viewer is taken to the top of a storage tank to see how samples of crude oil are withdrawn for subsequent laboratory testing for water content. Another scene emphasizes the im-



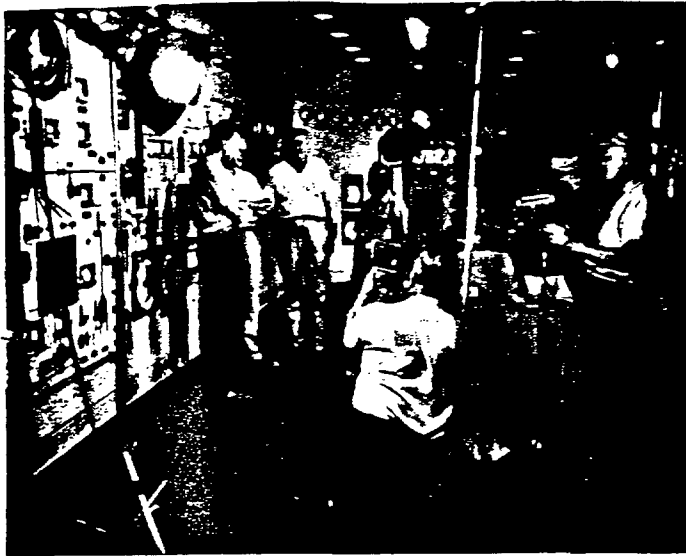
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In "Danger! Water!" actual procedures filmed during full-scale refinery and laboratory operations are supplemented by animated drawing sequences.

portance of repairing steam coil leaks inside a hot oil storage tank.

"Danger! Water!" is based on a Standard Oil Company (Indiana) publication entitled "The Hazard of Water in Refinery Process Systems." A major part of the filming took place at the Socony Mobil Oil Company's refinery at Paulsboro, N. J., under actual operating conditions. Winter scenes, pointing up the problems caused by ice during cold weather start-ups and operations, were filmed at Continental Oil Company's refinery at Billings, Mont.

Members of the American Petroleum Institute's Central Committees on Accident Prevention and Fire Protection reviewed the narration and cooperated in soliciting technical comment from the oil industry. Almost one hundred industry representatives were contacted.

The film was first shown at the API annual meeting in Chicago, last November. Since then, it has been shown to other oil industry audiences.

Prints are available through Ethyl Corporation and Ethyl Corporation of Canada offices. #





Retail gasoline outlets in the USSR

are do-it-yourself stops featuring

poor quality and high prices

Stations without Service

by Thomas L. Riley*

PRETEND FOR A MOMENT that you are Ivan Doe, Soviet citizen of Moscow and one of Russia's few privileged automobile owners. You have a Pobeda (Victory), the most popular car, which cost about \$3,000. You waited a long time to get it because total Russian car production is only about 110,000 units a year in a country of more than 200,000,000. And the Russian equivalent of 3,000 American dollars is no small stack of rubles.

Now at long last, you're out for a drive and notice that you need gasoline. You don't pull into a nearby service station and try the Russian equivalent of "Fill 'er up with premium and check the oil and water." If you did, you'd be in for lots of surprises.

In the first place, it's no easy job even to find a gasoline station. There are very few of them to serve the eight million people of metropolitan Moscow, and "service" is a part of neither their name nor their function. Secondly, the average sta-

tion has no fuel with anything approaching the octane quality of American motor gasoline. Further, motor oil isn't offered for sale where gasoline is sold. Russian motorists have to go to special stations for motor oil, lubrication and other basic necessities.

It hardly seems necessary to add that the only way to get a windshield washed is to do it yourself.

Of course, if you were Ivan Doe, you wouldn't be under any illusions about such things as "service" stations. Ivan is a product of controlled education, controlled experience, controlled reading and controlled thinking. He knows nothing about lots of the modern facilities that Americans take for granted. Chances are he doesn't know that such a thing as the modern service station exists—though there are some in nearby Scandinavian countries.

Shabby Buildings

Well, if they aren't *service* stations, what are the gasoline outlets in the USSR and what kind of cars do they supply?

The buildings for the most part are tiny, dilapidated, and in dire need of paint. The gasoline pumps, many of which were made in Germany, resemble those used in the United States quite a few years ago, except that they are electrically operated. Few if any stations have more than two pumps. One station, just outside the Kremlin wall off Moscow's Red Square, has but one.

A handful of stations in greater Moscow to serve a metropolitan population of eight million doesn't seem like many. But remember, there probably aren't more than 10,000 automobiles in this area and many of these are government-owned.

Stations are "manned" for the most part by burly middle-aged peasant women who wear leather boots, rough-textured blouses, skirts covered with white butcher-type aprons, and shawls on their heads. If requested, they will assist customers, but most taxi and truck drivers, government chauffeurs

*Thomas L. Riley is a widely travelled writer and photographer. He and his wife, Cyrilla, spent much of 1956 going around the world on freight ships. Prior to that, he had lived for some years in several South American countries. In the spring of 1958, the Rileys went to Russia. They spent most of their time in Leningrad and Moscow, and photographed the monster May Day parade in the Russian capital.



At the Leningrad "station without service" above, a cabbie willingly poses while filling the tank of his checkered Pobeda. In marked contrast, a government chauffeur in Moscow, below, refuses to be photographed full-face. Gasoline pumps throughout the USSR are painted red and measure fuel in liters. Until recently, pictures of them were not permitted.



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Stations without Service

and practically all others serve themselves and merely pay the women attendants.

The gasoline sold at the average station is good enough for the popular Pobeda, Volga and Moskvich cars, with their four-cylinder, low-compression, 40-horsepower engines. It is Russian regular and sells for about \$1 a gallon.

Motorists who are important enough in the so-called "classless" society to drive a larger Zis or Zim car have to go to one of the few special stations. These stations look no different, have no more modern pumps, and don't provide motor oil, lubrication or other services. But they do sell a gasoline more suited to these 65-horsepower, six-cylinder cars. It is said to be about 74 octane number.

For a nation so proud of scientific advances in many fields, the USSR is far behind the Western world in automobile design and manufacture.

More Trucks than Cars

It is estimated that there are about three-and-a-half million motor vehicles in the entire Soviet Union, in comparison with 67 million in the United States. The Russian figure probably does not include military vehicles.

Currently, truck production far exceeds that of passenger cars, but all trucks are owned by the state and drivers pay for their gasoline with coupons which are issued at a discount.

With the exception of a few cars belonging to foreign diplomatic delegations, all cars traveling

This Moscow station doubles as a bus stop. The sign on the pump merely says "Benzine"—Russian for gasoline; there are no brand names. Russian buses are similar to their American counterparts and are kept spotlessly clean, inside and out.



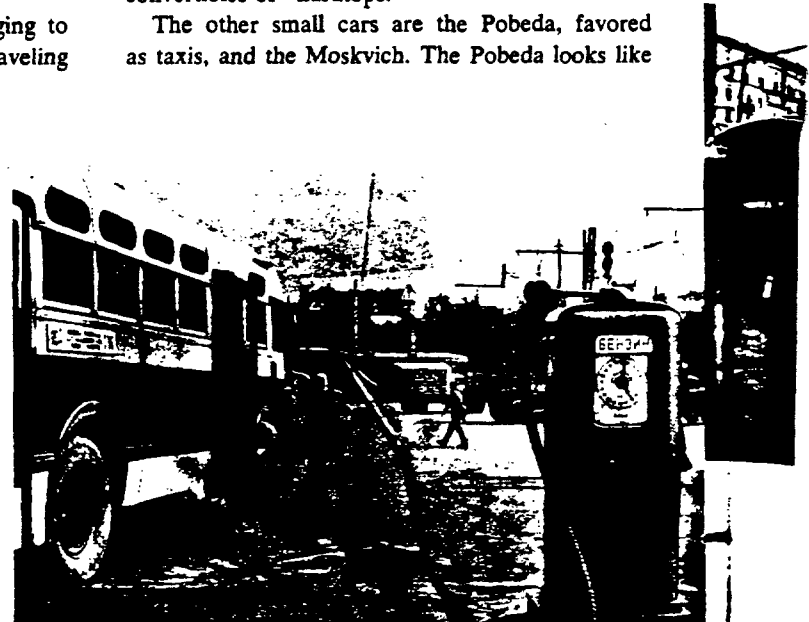
Russia's streets and highways are Soviet-made. The largest and most luxurious is the Zis, which has a handsome front end similar to the classic Packard design. The rest of it looks like a '48 Buick. It is not for sale, but is chauffeur-driven for officials of the government and certain key organizations.

The next grade car is the Zim. It sells for about \$10,000 and somewhat resembles a combination of the '48 Cadillac and Oldsmobile. Like the Zis, it is equipped for seven passengers and is painted solid black. A fire extinguisher is standard equipment in both cars.

Of the smaller, more popular-priced cars, the Volga is the newest and perhaps the best. It sports a one-piece curved windshield and is about the size of the Rambler American. The four-door sedan is priced at about \$7,500.

Incidentally, the Russians make only sedans—no convertibles or "hardtops."

The other small cars are the Pobeda, favored as taxis, and the Moskvich. The Pobeda looks like





This large—by Soviet standards—station is in Leningrad, the country's second city. The peasant woman attendant hid inside, but did not protest picture-taking.



Following the widely-employed do-it-yourself practice, a truck driver services his assigned vehicle. All trucks in the USSR are state owned.

an old model Chevrolet and the Moskvich resembles an English Ford.

Although the Russian consumer has been getting a somewhat better break recently, it doesn't appear that the petroleum and automobile industries will experience any great consumption increase for a long time. Meanwhile, the relatively few cars that the Soviets have are, for the most part, far behind American models in styling and performance.

And while millions of American motorists are enjoying the advantages of clean, fully-equipped service stations, manned by cheerful, well-trained attendants, the Russian has no choice but to put up with inferior products, high prices and no service. #



Above, the spire of the Peter and Paul cathedral is seen from under the portico of this station. The tallest building in Leningrad, the former church, now a museum, houses the tombs of Peter the Great and his daughter, Catherine the Great . . . Left, most of Russia's petroleum is refined in the South, near Baku, and shipped by rail to distribution points. From there, it is delivered to stations in truck-trailers like these.



Every one of our citizens has
a big job to do in helping to preserve
the traditional American way of . . .

Life, Liberty and..



by Brig. General David Sarnoff
Board Chairman, The American Heritage Foundation

IT IS NO NEWS to the Kremlin that one of the surest ways to bring about the downfall of the United States—without ever launching a missile or dropping an H-bomb—is to break down the traditional American respect for law and order. Indeed, the Communists already have their sights on this target. Witness, as one example, their smear campaign against J. Edgar Hoover and the Federal Bureau of Investigation.

Thus, a continuation—and strengthening—of respect for the laws of the land and the manner in which justice is administered become for each loyal American a matter of survival, to say nothing of the moral and legal obligations involved.

Since it's impossible to please all the people all the time, every aspect of our laws and our judicial system are not perfection in the eyes of every one of our citizens. But no thinking American ever would advocate scrapping all laws simply because one or two don't please him. This would be somewhat akin to a sports fan suggesting that all football rules be abolished because he doesn't agree that the penalty for clipping be 15 yards instead

of, say, 10 or 20 yards. Or the basketball enthusiast proposing that the scoring system for the court game be discarded because he feels that a field goal should count five points instead of two.

Just as athletic contests need rules to enable them to be played in an orderly and sportsmanlike fashion, so does society require a set of rules to govern its conduct. "Laws are," as John C. Cornelius, president of The American Heritage Foundation, points out, "the rules by which the game of life is played."

It should be the day-in, day-out effort of every citizen to strengthen his own and the nation's collective respect for law and order. This is a small price to pay for the liberty and other blessings that we Americans enjoy, Ross L. Malone, president of The American Bar Association, reminds us.

To give this year-round responsibility a focal point, the nation in 1958 began observing May 1 as Law Day. This date—May Day throughout the Communist world—was purposely chosen to point up the glaring contrast between the ideologies of the East and West. Law Day is sponsored jointly



"Teach children . . . respect for law and order . . ."

... Lawfulness

by The American Bar Association and The American Heritage Foundation.

What, the average citizen may ask himself, can I do to increase respect for law and order?

There are many things. Some that The American Heritage Foundation suggests are:

- Accept jury duty when called, regardless of personal inconvenience.
- Appear as a witness, give evidence and otherwise cooperate in the administration of justice.
- Teach children to grow up with respect for law and order, through such things as good example, family discussions and visits to courts.
- Publicly compliment law enforcement officers and jurists when they render extraordinary service.

If all Americans will do these four things at every opportunity, the nation's respect for law and order will be strengthened. There will never be any reason to fear that an enemy could overpower us because we had been weakened by a disregard for the laws of the land or the manner in which justice is carried out. #

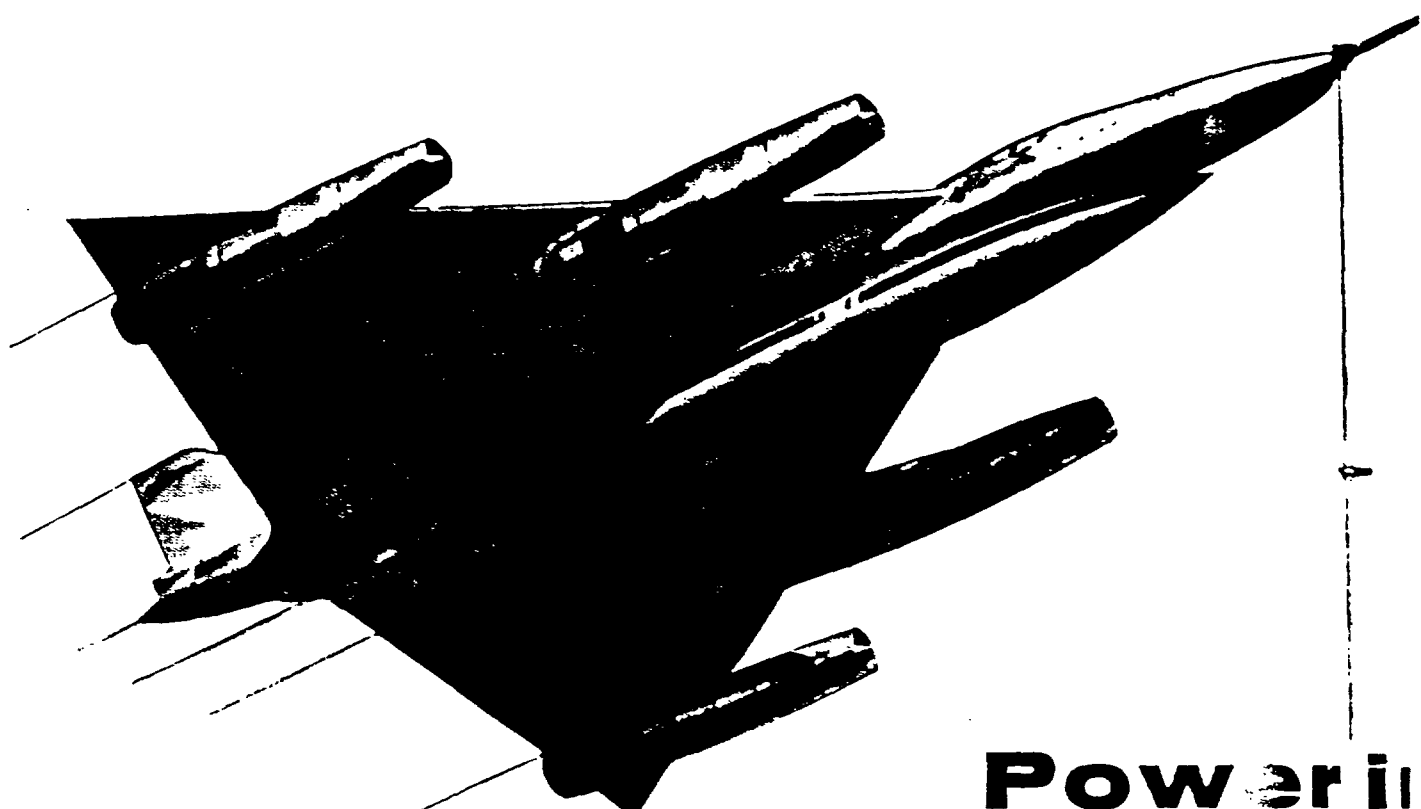


"Appear as a witness . . ."



"Accept jury duty . . ." and, left, ". . . compliment law enforcement officers . . ."



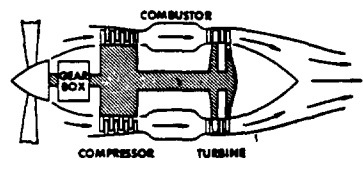


Power II

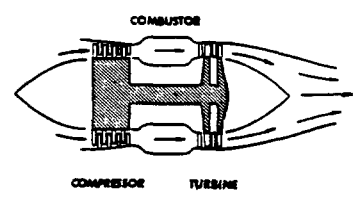
Ethyl studies aircraft and rocket propulsion as it anticipates supplying additives for high-energy fuels of the future

YESTERDAY'S FUTURE has become today's present. Out of the dreams, the plans and the research of the past, new aircraft and rockets have zoomed into reality. Jet planes are spanning oceans and continents in a few brief hours. Rocket-powered projectiles and satellites are circling the earth, stabbing into the atmosphere and probing the limitless worlds beyond.

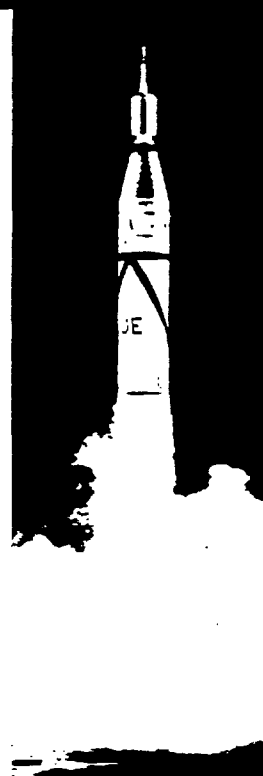
Power and speed are key ingredients in these breath-taking advances — power and speed that come from oil. Already, the petroleum industry plays a big part in supplying the fuels that propel rockets and aircraft at lightning speeds and with tremendous power. It anticipates an even larger role in the future.



TURBO-PROP



TURBO-JET



in the Skies

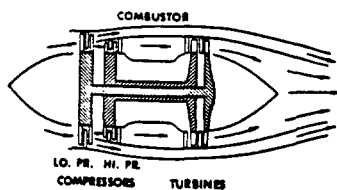
Ethyl Corporation looks forward to participating in fueling planes and rockets in two important ways: in supplying additives and components of high-energy and exotic fuels and in exchanging technology with the research branch of the oil industry.

Currently, of course, Ethyl supplies antiknock compounds for aviation gasolines and antioxidants which stabilize avgas and jet fuels. Looking ahead, there are indications that other chemicals which would represent only a small part of the fuels by weight or volume may play an equally important part in new aircraft and rockets. Triethyl and trimethyl aluminum, the markets of which Ethyl is now exploring, are good examples. Both ignite spontaneously on contact with air and therefore are

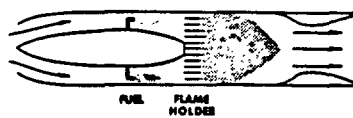
promising components of both aircraft and rocket fuels.

The Company also markets normal propyl nitrate and a mixture of ethyl nitrate and propyl nitrate. These compounds—called monopropellants—contain a large part of the oxygen needed to burn the hydrogen and carbon present. They are used in auxiliary power units in aircraft and may be used in rockets.

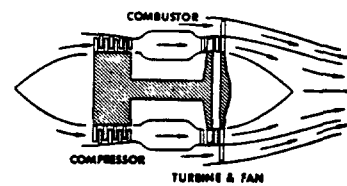
Additionally, Ethyl has a broad technical background in organo-metallic compounds and metal hydrides. Many of the compounds the Company has synthesized have interesting possibilities as additives for liquid fuels and for solid propellants for rockets.



BYPASS TURBO-JET



RAM-JET



DUCTED FAN

Power in the Skies

With these products and this valuable background, Ethyl Corporation has already obtained and is soliciting additional government contracts in the fields of aircraft and rocket fuels and additives. This has been done primarily to keep the Company up to date on the fast-moving technology of this field, so that it can do an intelligent job of applying its own background in combustion, organo-metals, and other research fields related to the development of useful additives.

For its own guidance, Ethyl has made a survey of aircraft and rocket propulsion—the various types of power units in use and on the drawing boards, their capabilities, fuels and fuel requirements. Because of the oil industry's interest in these subjects, Ethyl has shared the findings of its survey with the management of a number of companies.

Since turboprops and turbojets are already in commercial and military use, the survey report starts with them. Additionally, it discusses the bypass turbo-jet, the ducted fan type, and the ram jet. In the even newer field of rockets, it covers liquid fuel and solid propellant types, solar energy rockets, free-radical rockets, ion rockets and nuclear powered rockets.

In discussing types of fuel used in the different power plants—the report lists their important and desirable characteristics.

Workhorse Fuel

It is impossible to maximize all of these characteristics in one fuel, so engine builders and operators must pick the best compromise for each engine and operating condition. JP-4, a wide-boiling petroleum cut, is presently the workhorse jet fuel, with JP-6, RP-1 and RJ-1 used in smaller quantities.

For more heating value per pound of fuel, there are the so-called "high-energy" fuels. Some of the

building blocks for these fuels are listed with their essential characteristics. Additionally, comparative costs of varying types of jet fuel are shown.

Desired qualities of rocket fuels differ in some respects from those of air-breathing engines. Rocket combustion should give high temperatures and the energy imparted to the combustion products should accelerate them to high velocities.

Tables listing liquid and solid rocket fuels, oxidizers and values of specific impulse (pounds of thrust per pound of fuel and oxidizers used per second) appear in the survey report. In both liquid and solid types the important component is the oxidant, since the weight of the oxidizer must be three to five times the weight of the fuel.

Summarizes Fuel Demands

Finally, the Ethyl study summarizes present and estimated future fuel demands. In this connection, it lists, by type, the number of aircraft in use by scheduled and non-scheduled U.S. airlines, the number on order by the same lines, and expected delivery dates.

Based on these data, it is clear that airline use of jet fuels will climb rapidly in the immediate future—from an estimated 6,000 barrels a day in 1958 to 175,000 b/d by 1962. Concurrently, expansion of commercial airline passenger and freight service will result in their using larger quantities of aviation gasoline as well. Predictions call for a consumption of 95,000 b/d of avgas in 1962 as compared with 88,000 b/d at present.

The oil industry is accustomed to thinking of fuel use in terms of thousands and millions of barrels a day. The use of high energy fuels, liquid fuels for rockets and solid propellants for rockets will not be in this category. Their use will probably be measured in millions of pounds per year for some time.

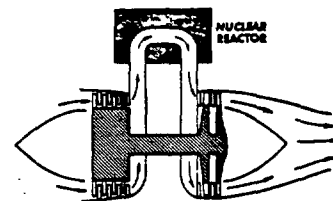
As they continue to work in these fields—so vital to the nation's security and progress—the oil industry and Ethyl Corporation will be speeding the arrival of the future.



LIQUID-FUEL ROCKET

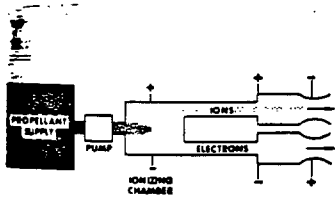
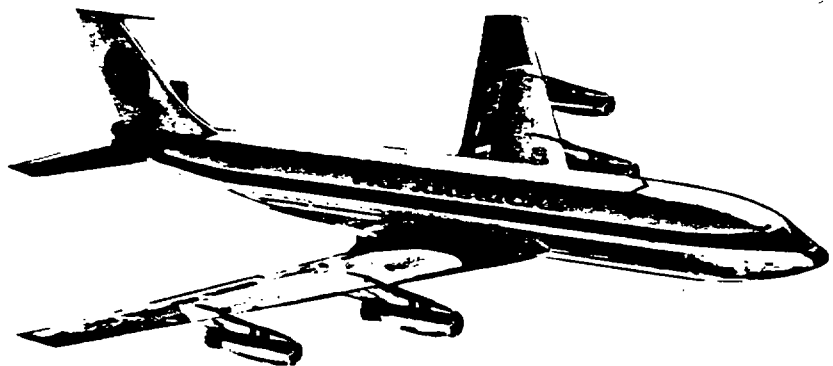
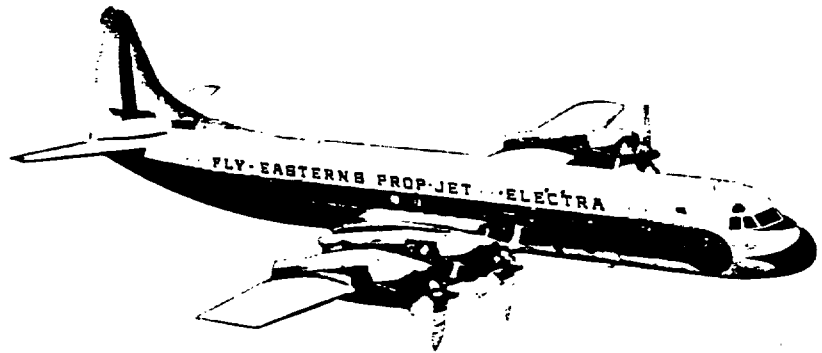


SOLID-PROPELLANT ROCKET



NUCLEAR ENERGY POWER PLANT
(One form)

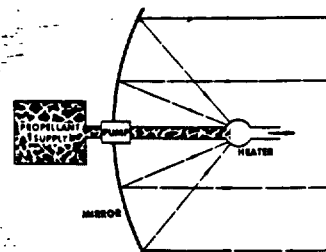
Commercial aviation's growth means corresponding changes and increases in airline fuel requirements. With the expansion of passenger and freight service, hundreds of piston-driven planes, like the DC-7, top, will be used widely for many more years. This is expected to result in continuing increased demands for aviation gasoline. At the same time, fuel needs for prop-jet and turbo-jet aircraft, such as the Lockheed Electra, center, and Boeing 707, bottom, will jump sharply.



ION ROCKET



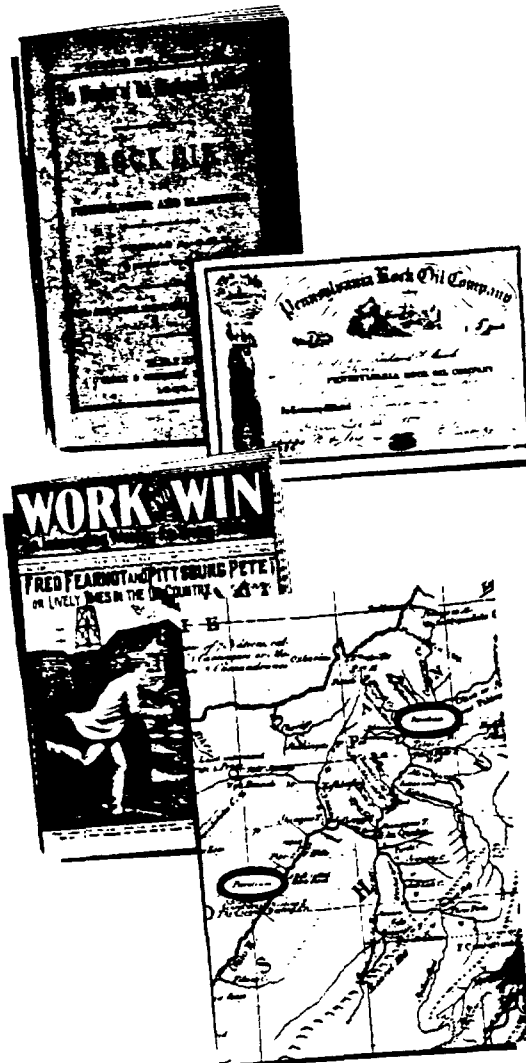
FREE-RADICAL ROCKET



SOLAR-ENERGY ROCKET

Illustrated talk and display of items from Ethyl Corporation's collection of Petroleum Americana include many . . .

Pages from Oil's History Book



SOME 28 MILES west of the discovery well that launched the modern oil industry 100 years ago, the first events of petroleum's centennial year took place this January. At Allegheny College, in Meadville, Pa., a group of oilmen and residents of Western Pennsylvania gathered to look back at the colorful beginnings of the industry and to help launch its 100th birthday celebration. At the same time, a display of significant documents from petroleum's early days was presented.

That these events should have been sponsored by Allegheny is not illogical. The college was preparing to launch its 45th academic year, in August 1859, when word came that Colonel Drake had struck oil over in Titusville. Almost immediately, preparations were made to put the school's facilities at the disposal of the thousands who were to pour into Western Pennsylvania seeking oil.

While there turned out to be no immediate rush to the college, inquiries did come in and soon an association with the oil industry was established that has lasted down to the present.

The premier events of the centennial year were held January 23, 24 and 25. They centered around a display of informative items from Ethyl Corporation's collection of Petroleum Americana and an

1859
1959
OIL'S FIRST CENTURY
-BORN IN FREEDOM
WORKING FOR PROGRESS



Among those viewing displays were William H. Parsons, Allegheny geology professor, and Clyde W. Gebhardt, United Oil Manufacturing Company.



James E. Boudreau, Ethyl Corporation public relations director who spoke on the early days of oil, and Dr. Lawrence L. Pelletier, Allegheny College president.

Illustrated talk on the early days of the oil industry.

Giving the talk, was James E. Boudreau, director of public relations for Ethyl Corporation and a student of early American oil history. Mr. Boudreau has been responsible for assembling the Ethyl Corporation collection of Petroleum Americana, one of the most complete in existence.

Included in the collection are mementoes from the then-infant industry—some of them the only known copies still in existence. They throw revealing light on oil operations and how they were conducted in the years immediately after the Drake well. Additionally, other items show how oil soon became woven into the fabric of American life and the important part it played both socially and economically.

Most of the collection is in the form of printed materials. It includes advertising circulars, bonds, leases, stock certificates, books, maps, newspapers



H. M. Miller, West Penn Oil Company president, and Philip M. Benjamin, Allegheny College librarian, discuss the significance of the historic oil documents.

and magazines, pamphlets, reports, sheet music and dime novels.

One of the rarest items is a stock certificate in the Pennsylvania Rock Oil Company, the first company ever formed to drill for oil. It is dated December 1855, almost four years before actual drilling efforts were rewarded with success. Three other outstanding pieces are the Evans map, printed by Benjamin Franklin in 1755, which notes the presence of petroleum not far from where Drake sank his successful well more than 100 years later; the first book about oil, entitled "The Wonder of the Nineteenth Century: Rock Oil in Pennsylvania and Elsewhere"; and the Silliman report of 1855, the scientific evaluation of petroleum that encouraged investors to drill for oil.

Harry A. Logan, Jr., United Refining Company president, studies some of the Petroleum Americana.





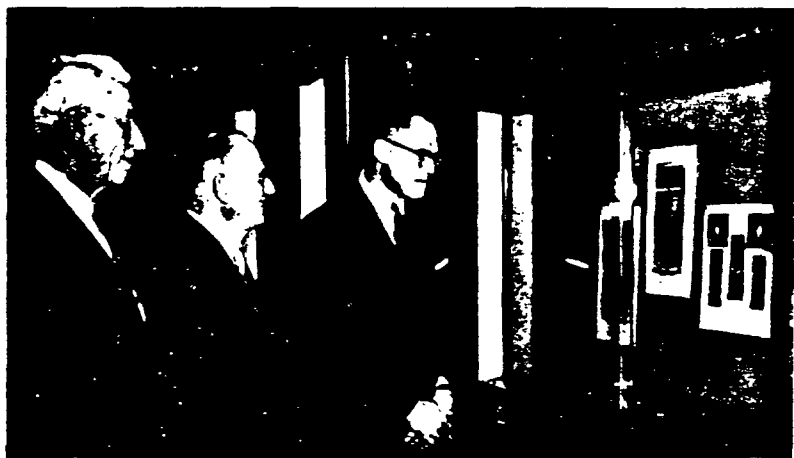
Items in one of the displays included historic stock certificates, trade reports, souvenir buttons, advertising cards, books and magazine articles.

Oil songs of the early days recorded on sheet music include such intriguing titles as "Oil on the Brain," "Petroleum's What's the Matter," "Struck Ile." and "Oil Fever." No less arresting are fictional gems like "Fred Fearnot and the Oil King; or, The Tough Gang of the Wells" and "Struck Oil; or, The Boy Who Made a Million."

Illustrated by these and many other historic oil documents, Mr. Boudreau's talk told an interesting story of early oil operations and life in the oil country. It described and pictured the crude drilling and refining operations of the 1860's, when forests of oil rigs and primitive stills blanketed the hillsides and valleys of Western Pennsylvania. It portrayed the hardships of the first efforts at petroleum transportation, including the dramatic surges of flatboats down Oil Creek in pond freshets and the laying of the first pipelines.

Equally intriguing as the oil operations themselves were the pictures and descriptions of life in the oil fields. The story of fabulous Pithole, the town that sprang from nothing to a bustling, booming oil town of thousands and then passed into oblivion, was recounted in some detail. Coal Oil Johnny, Ben Hogan, Colonel E. A. L. Roberts, John Wilkes Booth and other colorful figures of the times came to life in the talk as their exploits were recounted.

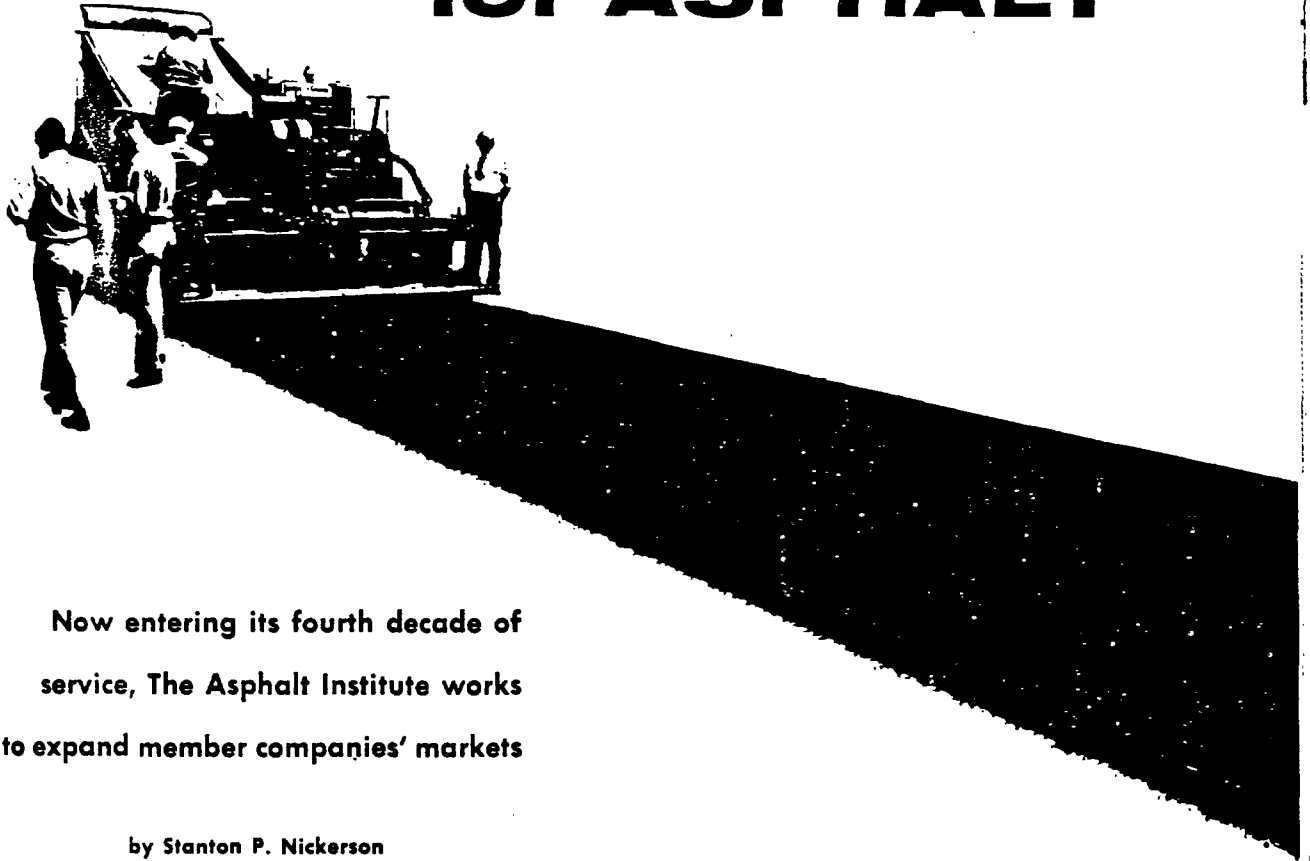
The growth of the industry from before its very birth through its first several decades, and the development of its producing, refining, transportation, marketing and financial activities were recounted with colorful and now-amusing illustrations. The talk provided an informative glimpse of the early days of oil—particularly in contrast to the efficient operations which typify the industry today. #



This interested group of Allegheny alumni was made up of Paul McKay, retired civil engineer; Walter M. Small, oil geologist and consultant; and Robert T. Sherman, College development director.

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Paving the Way for ASPHALT



Now entering its fourth decade of service, The Asphalt Institute works to expand member companies' markets

by Stanton P. Nickerson

WHenever highway engineers choose a paving material for new roads or decide how to re-surface older ones, they weigh such pivotal factors as ease of construction, durability, driving qualities, safety properties and comparative costs. Because asphalt is superior on these and many other counts, it is being specified with increasing frequency, rather than slabs of rigid cement.

Every time another road is paved with the familiar black petroleum product, it represents another achievement by The Asphalt Institute and its members.

Now entering its fourth decade of service, the Institute works aggressively to expand markets for all asphaltic products. It is supported by 56 member firms in the United States, Canada and abroad, most of them oil companies, affiliates or subsidiaries.

Investigations leading to new and improved asphalt applications are being pushed continuously through The Asphalt Institute's research, engineering and educational programs.

In addition to its own laboratory investigations, it conducts cooperative projects with state high-

Paving the Way for Asphalt

way departments and engineering colleges. Particularly on the graduate level, the Institute sponsors courses in asphalt technology and awards annual fellowships for study in related fields.

Consultive and advisory services to consumers are keystones of the Institute's engineering services. Publications, films, advertising and a public relations program stress asphalt's advantages.

These and related enterprises are directed from the Institute's headquarters on the University of Maryland campus at College Park, Md.

Five divisional offices are located strategically throughout the country. Each is responsible for local-level engineering services, educational activities and industry representation among states, counties, cities and engineering colleges.

One of The Asphalt Institute's most important contributions is in doing jobs that could not be performed by individual producers or marketers.

At one time, for example, there were 102 different specifications for grades of asphalt cement used on heavy-duty highways. Institute efforts reduced them to five. The number of cutback grades for secondary roads was brought down from about 200 to 12. This kind of simplification means substantial annual savings to producers and consumers alike.

Most federal agencies and state highway departments welcome professional engineering assistance from the Institute. On the other hand, when hostility to asphalt is found, the Institute makes concerted efforts to reverse such thinking.

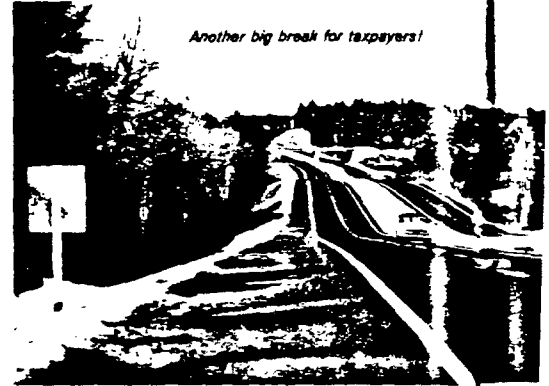
Strengthening public demand for asphalt paving, and convincing engineers to specify it in preference to slab cement, are among the Institute's most noteworthy accomplishments.

How successfully is The Asphalt Institute doing

Asphalt-paved Maine Tu

Initial construction savings will pay

Another big break for taxpayers!



The re-opening of the Maine Turnpike...
 The Asphalt Institute...
 THE ASPHALT INSTITUTE

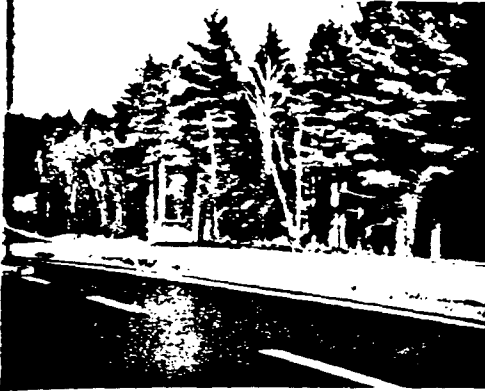
Directed to engineers, motorists and civic leaders, a national advertising campaign is sponsored by

This coring machine removes samples of asphalt-paved streets for testing at Institute laboratories.

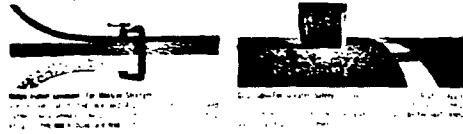


Turnpike pays off big!

pay maintenance costs for 40 years.



Newest highway construction! Modern Asphalt pavement.



the Institute. Illustrated messages like this are used to point out asphalt's advantages.

its job? Are member companies' investments of time, manpower and money rewarded?

The best way to answer questions like these is to cite asphalt sales increases since the Institute was founded. Highway uses, which include more than two-thirds of all applications, have jumped from less than two million tons annually to nearly 20 million tons last year. Today's highway market represents revenues to asphalt producers of almost \$350 million.

The black petroleum product is a basic paving ingredient on 85 percent of all principal thoroughfares in the country today. Of all primary roads completed in the past five years, more than 90 percent are asphalt ones.

The Asphalt Institute's accomplishments are not limited to highways. In another achievement, it is proving that asphaltic concrete is ideal for the runways of major airports, even those used by the heaviest commercial and military jet aircraft.

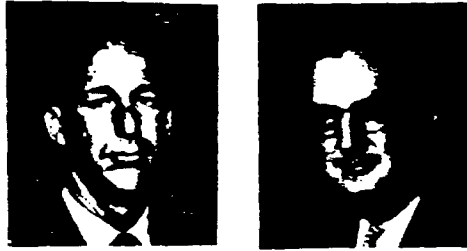
Less dramatic but still significant is the accelerating use of the dark bituminous product on parking lots and playgrounds, gutters and curbs, and buildings. Institute efforts also are credited with more widespread application of protective asphalt

Mixes of asphalt and "aggregate," or crushed stone, are prepared for exhaustive durability evaluations.



The Asphalt Institute's headquarters include offices, laboratories and testing facilities in this modern brick colonial building on the campus of the University of Maryland, at College Park.





Don L. Nielson, Union Oil Company of California, board chairman, and Dr. James E. Buchanan, president, the Institute's principal officers.

coatings on canals and dams, and for erosion control abutments.

In these and other efforts, The Asphalt Institute is directed by experienced officers from member firms and a full-time staff. Don L. Nielson, of Union Oil Company of California, is board chairman. Division vice presidents are Richard B. Lewis, Shell Oil Company; James S. Van Pelt, Berry Refining Company; Eugene M. Stone, Empire Petroleum Company; Jeff P. Royder, Humble Oil & Refining Company; and Farrell L. Dunlap of Richfield Oil Corporation (California).

The Institute's continuing administrators are Dr. James E. Buchanan, president; Arvin S. Wellborn, secretary and chief engineer; and Joseph J. Tumpeer, treasurer.

The Institute sees its greatest and most immediate opportunity in helping to assure asphalt's use

on the new 41,000-mile interstate highway system now under construction at an estimated total cost of \$40 billion.

A national advertising campaign, directed to highway engineers, motorists and cost-conscious officials, is focused on this objective. It emphasizes the advantages of heavy-duty asphalt and plays up its economy.

Concurrently, institute engineers are exploring ways and means to improve a major part of some two million miles of rural roads with asphaltic bitumens at attractive low costs.

Promising New Use

One of the most promising new uses for asphaltic oils is on the ballast and ties of railway roadbeds. The Institute's 10-year experimental program, conducted jointly with the Association of American Railroads and the Illinois Central, shows that it can provide savings of more than \$2,000 a mile in maintenance costs.

This railroad use of asphalt suggests a potential new market approaching a million tons annually.

Asphalt's future consumption will be boosted further by the cumulative impact of long-range Institute projects. These include assisting in the education of tomorrow's engineers, providing answers to hundreds of technical questions annually, and sharing the results of research with Asphalt Institute members. #



Pamphlets and brochures like these are among scores of informative publications that the Institute uses as educational and promotional aids.

Dr. Karl V. Kitzmiller Heads Ethyl Medical Department

DR. KARL V. KITZMILLER has been appointed director of Ethyl Corporation's Medical department, with headquarters in Cincinnati. Dr. Kitzmiller succeeds Dr. Robert A. Kehoe, who has retired after serving as Ethyl's medical director for more than 33 years.

Dr. Kitzmiller joined the Ethyl Corporation medical staff in 1926. He was promoted to medical supervisor in 1942, to assistant medical director in 1946, and to associate medical director in 1951.



Dr. Karl V. Kitzmiller

Over the years, Dr. Kitzmiller has devoted much of his time to medical supervision of field representatives, safety engineers and refinery mixing plant personnel. He is associate professor in the Institute of Industrial Health, College of

Medicine, University of Cincinnati.

Dr. Kitzmiller was born in Maryland and received his BS and MD degrees from the University of Cincinnati. He is a member of the American Medical Association, the American College of Physicians and is a diplomate of the American Board of Internal Medicine, and of the section in Occupational Medicine of the American Board of Preventive Medicine.

Dr. Frank Princi, professor of industrial medicine and assistant director of the Institute of Industrial Health at the University of Cincinnati and associate director of the Kettering Laboratory, has been appointed associate Medical department director. Dr. Princi has been associated with Ethyl for the last 10 years. He received his BA and MD degrees at the University of Colorado. He is a member of a number of professional associations and societies and a special consultant to several government agencies. #



Dr. Frank Princi

Leonard L. Huxtable Named Manager of Western Region

LEONARD L. HUXTABLE has been named manager of the Western region of Ethyl Corporation's Sales department, with headquarters in Los Angeles. Mr. Huxtable succeeds Meredith Littlefield, who has been granted a leave of absence.

Mr. Huxtable joined Ethyl in 1932 and has spent his entire Company career in sales work in the Midwest and Southwest. He was assistant manager of the Southern region, with headquarters in Tulsa, from 1955 until his recent promotion.



Leonard L. Huxtable

A native of New York City, Mr. Huxtable was graduated from Purdue University with a BS degree in mechanical engineering.

In other Ethyl Sales department appointments, J. O. Balzer was named to succeed Mr. Huxtable



J. O. Balzer



J. E. Hendrick

as assistant manager of the Southern region, and J. E. Hendrick succeeds Mr. Balzer as Houston district manager.

Mr. Balzer, who has had 29 years' experience in the Ethyl Sales department, was born in Ohio and attended the University of New Mexico. Mr. Hendrick has been in technical service and sales work for Ethyl in the Southwest for the last 26 years. He is a native of Mississippi and holds a BA degree from Mississippi College and an MS from Vanderbilt University. #

"Boss Ket" and the K



Ever interested in engine fuels, Mr. Kettering checks on the correlation between molecular structure and anti-knock quality of hydrocarbons.

Equipped with goggles and protective helmet, the "Boss" is shown as he was about to embark on a tour of one of Ethyl's manufacturing plants.



After many years of close association, the names Charles F. Kettering and Ethyl are almost inseparable

IF CHARLES F. KETTERING had still been alive this February 2, his thoughts would no doubt have flashed back, as they had every year for the last three dozen, to the events of February 2, 1923. For it was on that date, in his long-time home town of Dayton, Ohio, that "Ethyl" gasoline first went on public sale.

"Boss Ket" is credited with more than 150 scientific inventions and discoveries in his 82 fruitful years. But with none of them is his name more closely linked than with "Ethyl" gasoline and consequently with Ethyl Corporation.

This is natural. The very idea of searching for some way of overcoming knock was Mr. Kettering's in the first place—some 46 years ago. At the time of his death last November, he still served as the very active senior member of the Ethyl Corporation board of directors. Over the intervening years, his inspiring leadership, scientific genius and unflinching optimism made incalculable contributions to the discovery and use of "Ethyl" antiknock compounds and the Company that bears their name.

Not a Roadblock

It was characteristic of "Boss Ket" that he heard knock not as a roadblock to automotive progress but as a "knock of opportunity."

Research leading to the antiknock properties of tetraethyl lead started in his laboratories seven long heartbreaking years before that memorable February 2, 1923. Problems associated with its de-

Knock of Opportunity

velopment and use were to continue long afterward, but it was one of the dates he never forgot.

Another, of course, was December 9, 1921. Mr. Kettering was later to call that the most dramatic day of his entire research career. That was when the research team working under his direction discovered the antiknock properties of TEL.

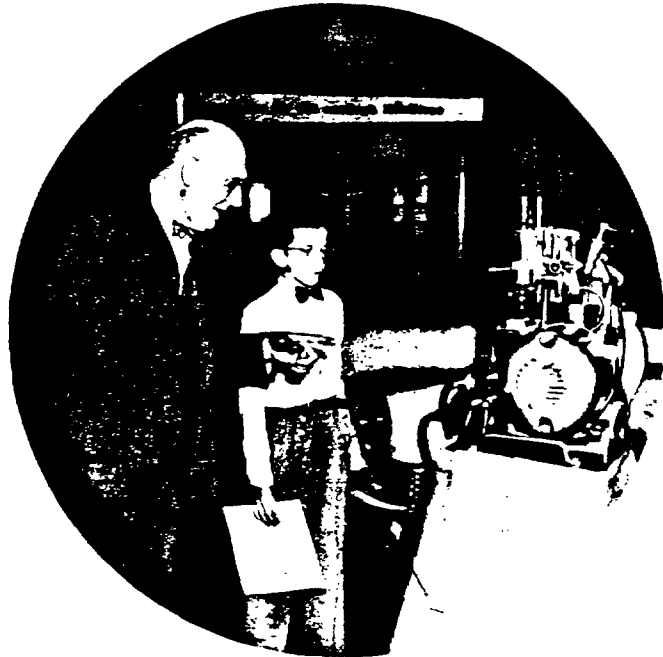
Reflecting on these years, he once recalled: "Our early work was mostly a succession of failures, with just enough success to keep us going."

First President of Ethyl

Upon the formation of Ethyl (Gasoline) Corporation, "Boss Ket" became the first president, getting the company off to a successful start.

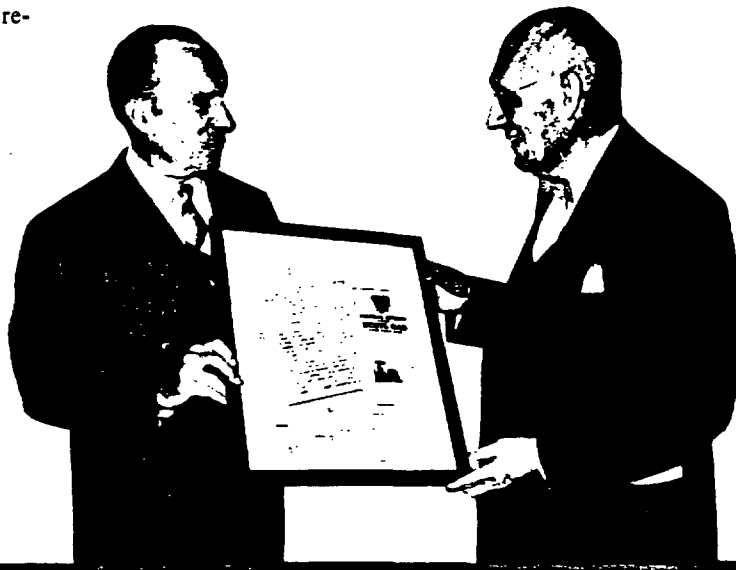
Relinquishing the presidency after a time to devote himself more fully to the research work he so dearly loved, Mr. Kettering continued contributing invaluable to the development and use of "Ethyl" products.

As a member of the Company's board of directors from its incorporation until his death, he was continually active. He played a vital part in the growth of the organization and its far-reaching re-



An ardent believer in young people, Mr. Kettering takes time to explain an Ethyl demonstration engine to a scientist of tomorrow.

Many years after the originals were drawn up, E. L. Shea, then Ethyl's president, presented "Boss Ket" with copies of the Company's first advertising and its first contract with a major oil company.



"Boss Ket" and the Knock of Opportunity



With Thomas Midgley, Jr., the man who headed the TEL discovery research team, the "Boss" recalls with pleasure their many years of close association.



Mr. Kettering's unfailing optimism was a constant source of inspiration to Ethyl employees on his visits to plants, offices and research laboratories.

search, manufacturing and marketing activities. Ever interested in its success and its future, he met frequently with Ethyl people not only at board meetings but on visits to offices, plants and laboratories.

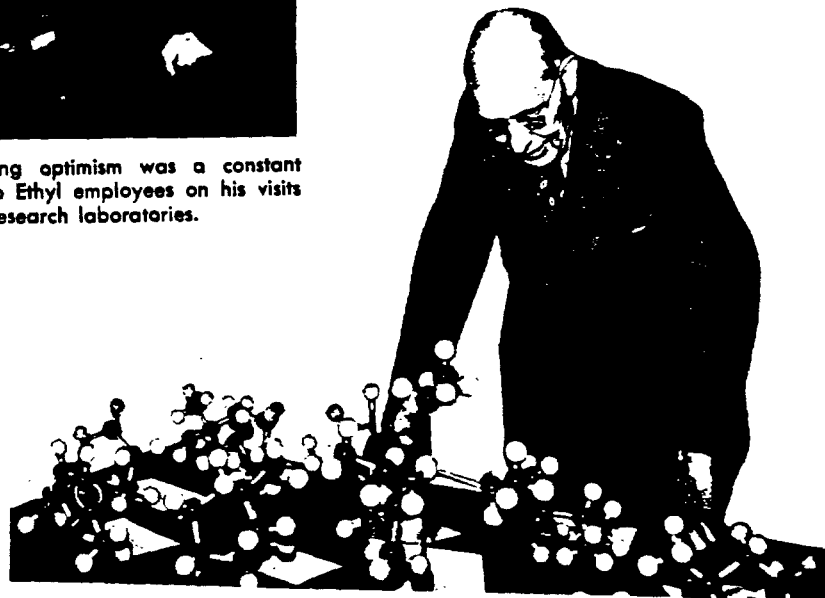
While it probably never will be possible to measure "Boss Ket's" contributions, two attempts have been made which stand out above many of the others. One was by Thomas Midgley, Jr., the man who headed the TEL discovery research team and who became one of the great chemists of his time. In introducing his "Boss" to a meeting of the American Chemical Society, Mr. Midgley said: "I am not overstating the case when I say that everything worthwhile I have ever accomplished has been done under the magic spell of his inspiration."

Another Tribute

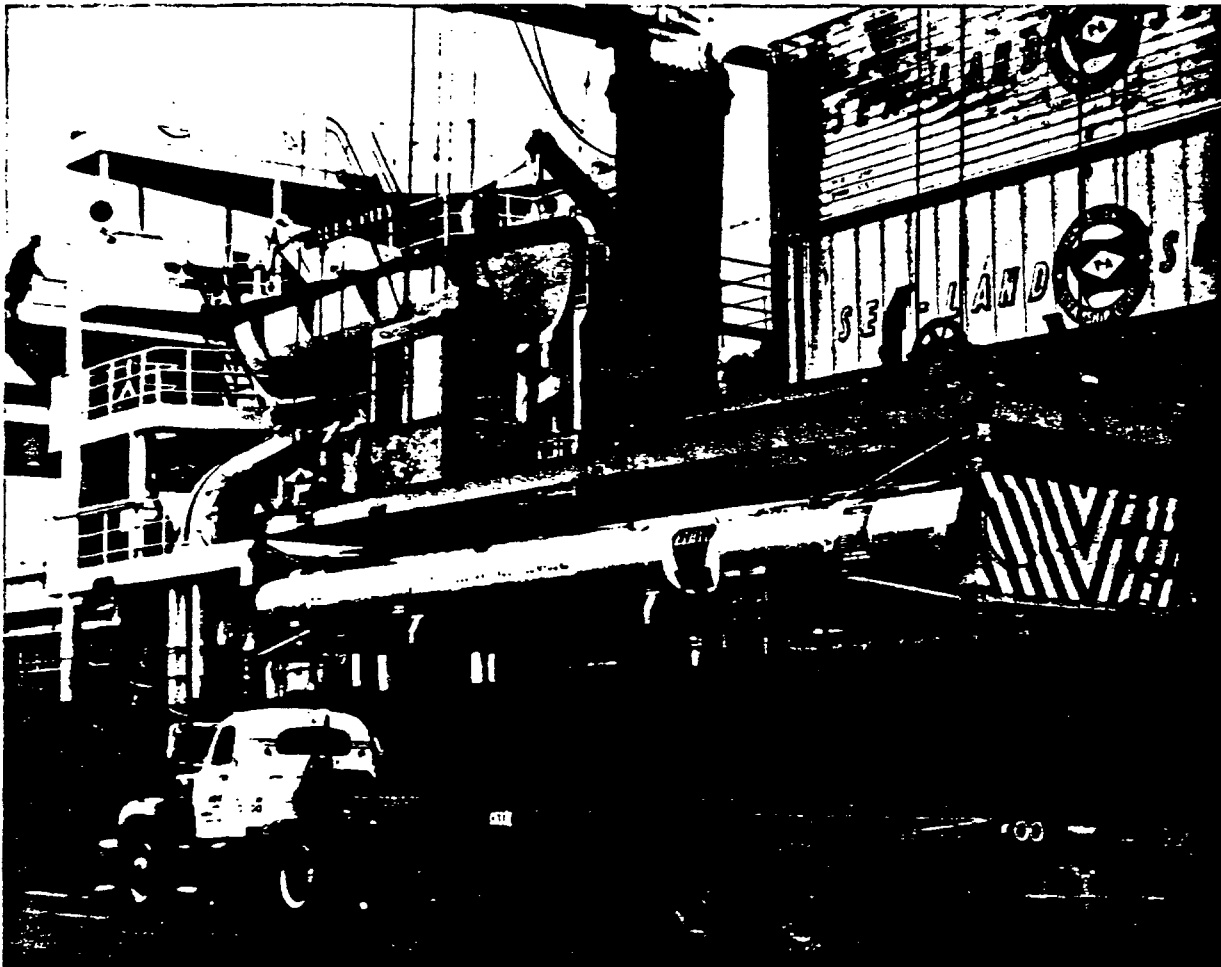
The other is found in a booklet published on the beloved "Boss Ket's" 75th birthday celebration eight years ago.

"Throughout the life of 'Ethyl' gasoline and the men who developed it, nursed it through the 'shirt-losing period,' and guided it to eventual success," the booklet says, "the genius of Kettering has been ever apparent. He conceived its need, supervised its discovery, fought its failures, preached its virtues, and dreamed its destiny. He even chose the name and wrote its first advertising. As might be expected, he is rather proud of the way things have worked out. He has always had a very warm spot in his heart for 'Ethyl.' . . . It is a pleasure to remind him that the five thousand men and women who work in his 'Ethyl' business revere him."

It hardly seems necessary to add that the whole world does, too. #

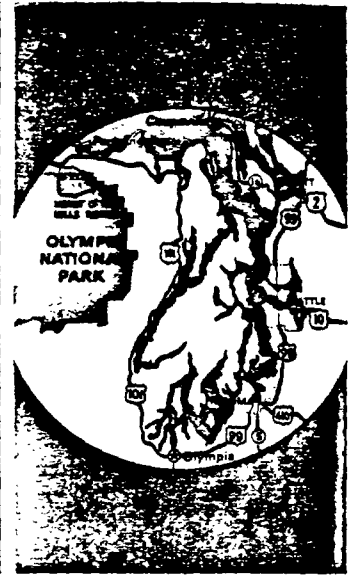


Sea-Land Service Speeds Shipments of "Ethyl" Fluid to Overseas Refiners



IN a unique method of shipment inaugurated last fall and now in regular use, a 2,200-gallon tank of "Ethyl" antiknock compound starts on an overseas journey. Transported by truck-trailer to dockside, filled tanks are hoisted aboard ship by gantry cranes. At the port of destination, they are lifted from the ship and placed on another truck-trailer for highway delivery to the refinery.

The method utilizes the Sea-Land Service of the Pan Atlantic Steamship Corporation between the United States and Puerto Rico. Each of the specially-designed tank units holds the equivalent of 40 standard 55-gallon drums of antiknock compound. They can be emptied in about one and one-half hours as compared with six hours for 40 drums. Their use also saves a substantial amount of handling time in transit.



Relive the Indian days by car. They seem very near when you're next to these totem poles. And they are. Wherever you live, you'll find equally fascinating reminders within a few quick driving miles of home.

Your car makes any map a Magic Circle

The fun you'll find in this Totem Magic Circle is as many-faced and colorful as a totem pole itself. There's a Magic Circle just like it right around you. Start exploring it with your car. Just for fun.



Published by Ethyl Corporation, New York 17, N. Y., to help you get more enjoyment out of your car. Ethyl Corporation manufactures antiknock compounds, used by oil companies everywhere to improve their gasolines and your driving pleasure.



Give yourself a change of scenery. In your Magic Circle, get away from it all on highways like the Heart O' The Hills Road. Enjoy views like this sweep of the Olympics.



Set your course for the water. Hitch a small boat to your car. (It's the weekend way of life around Puget Sound.) Or simply head for a shore near you and let come what may. Scores of discoveries await you.



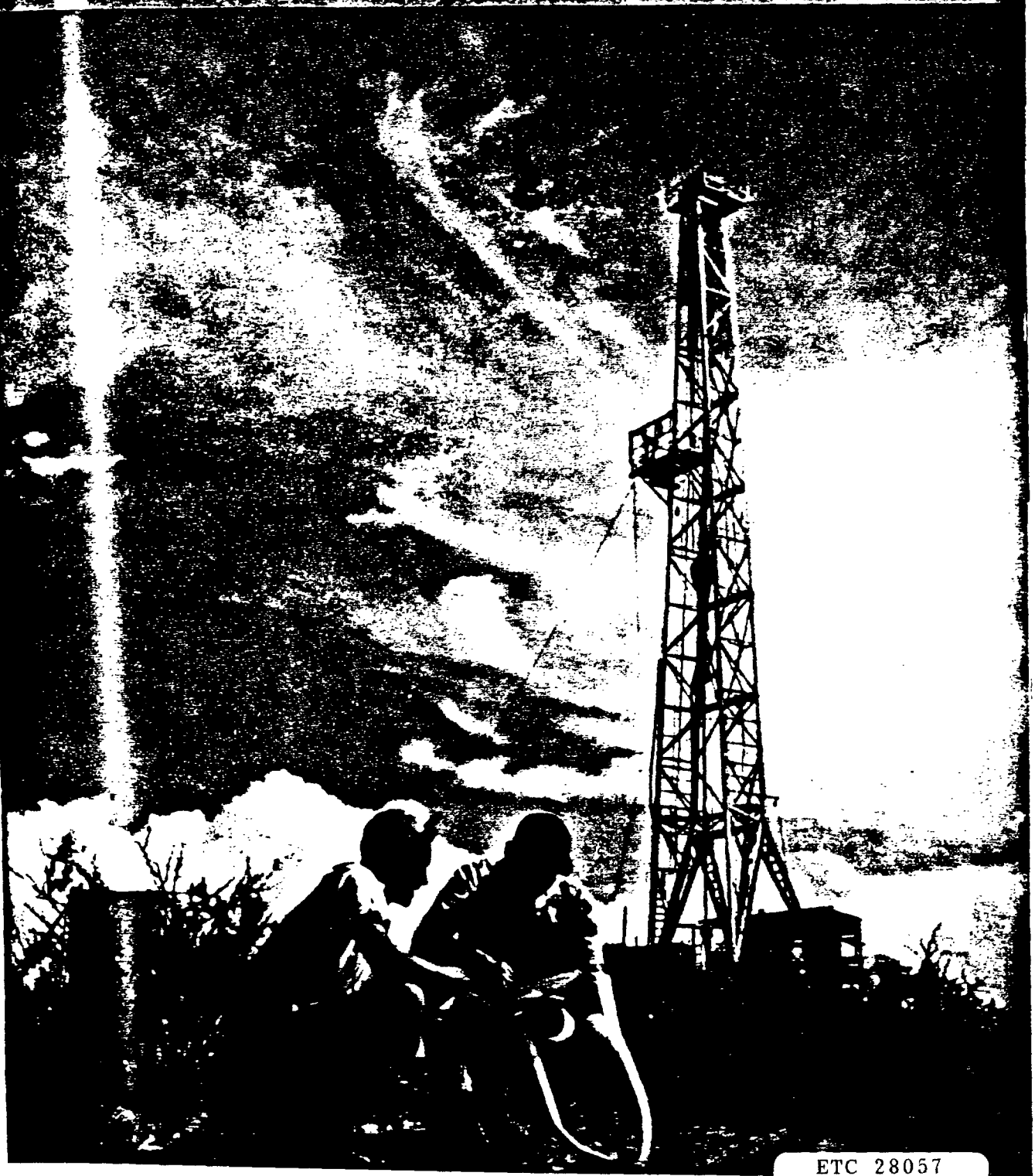
Tour the out-of-the-way shops. Seattle's are full of delightful discoveries from all over the world. You'll find the match for them in your Magic Circle. Some day soon, set out by car and see for yourself.



Map out your Magic Circle. Your car is your best investment in fun. Don't miss out on its happy returns. Start driving—start really *living*—next chance you get.

ETC 28056

ETHYL NEWS



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D.B.
W.F.

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ETHYL NEWS

MARCH-APRIL 1959



THE COVER shows field geologists studying the log of an oil well being drilled by a folding rig in Winkler County, Texas. The risks and uncertainties involved in finding oil are two of the reasons why percentage depletion is so important to the industry, as you'll read in "A Story That Should Be Told," starting on page 1.

**OIL'S FIRST CENTURY
-BORN IN FREEDOM
WORKING FOR PROGRESS**

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Ethyl Corporation, 100 Park Avenue, New York 17, N. Y. manufacturer of "Ethyl" antiknock compounds, used by oil companies to improve the antiknock quality of motor and aviation gasoline

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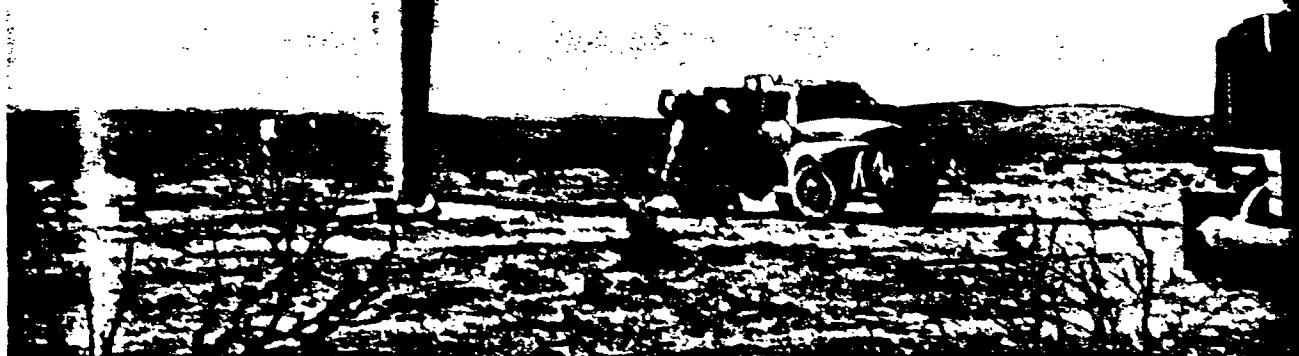
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Because of its importance to the continued vitality of the oil industry, an explanation of percentage depletion is . . .

A STORY THAT SHOULD BE TOLD



THREE MILLION DOLLARS and 25,340 feet after drilling operations began, the world's deepest oil well—in Pecos County, Texas—has been abandoned. It turned out to be a “duster” or dry hole. It produced no oil or gas.

The fate of that great well wasn't particularly surprising to oilmen. Experience has taught them to expect costly disappointments like that. Even with all the scientific equipment and know-how at their command, they have come to know that only one out of every nine exploratory wells produces any oil or gas. Only about one well in 48 proves profitable.

The story of the failure of the world's deepest well, with its \$3 million investment, should be told over and over again outside the industry—especially to those who regard oil as a sure-fire, big-profit, no-risk business. These people—through their unfamiliarity with the uncertainties and costs

of finding and producing oil—are the most vocal opponents of percentage depletion.

It is particularly ironic that the oil industry should be forced to defend percentage depletion—one of its basic essentials—in its Centennial year—at a time when it is being hailed for past accomplishments and looked to for even greater things in the future.

Looking back over 100 years of growth and progress, it's quickly evident that oil has never failed to meet the challenges of war or peace. Its contributions have helped raise America's living standards to undreamed-of heights.

Looking ahead, the industry will be expected to play a big part in an alert and powerful national defense and supply a demand for its products which is expected to be up as much as 60 percent in just 10 years.

With oil's past record of outstanding performance

I

and in the face of growing demands, it is surprising that there are those who still attack depletion as a "tax loophole" or an "allowance" that gives undue benefit to producers. Actually, it is percentage depletion that has enabled the industry to make many of its contributions, and on which it depends to meet many of the demands of the future.

Percentage depletion, as now constituted, has been in effect since 1926. But as early as 1913, the Federal government recognized the great risks in exploring for and producing oil—and the fact that an oil company, in producing and selling oil, is using up its principal asset. That is why the government permits oil producers percentage depletion—because they are using up something they can never replace.

Percentage depletion permits oilmen and producers of other mineral resources to deduct a percentage of the *gross* income from such resources before computing their annual income taxes.

Actual Rate Near 23 Percent

In the case of gas and oil, the depletion rate is 27½ percent. In other words, 27½ percent of the *gross* income from the production of each oil well or property is not subject to taxation. (A limitation provides that tax deductions may not exceed 50 percent of the *net* income from each particular property. Because of this limitation, it is important to note that the rate of percentage depletion for the petroleum industry actually works out to nearer

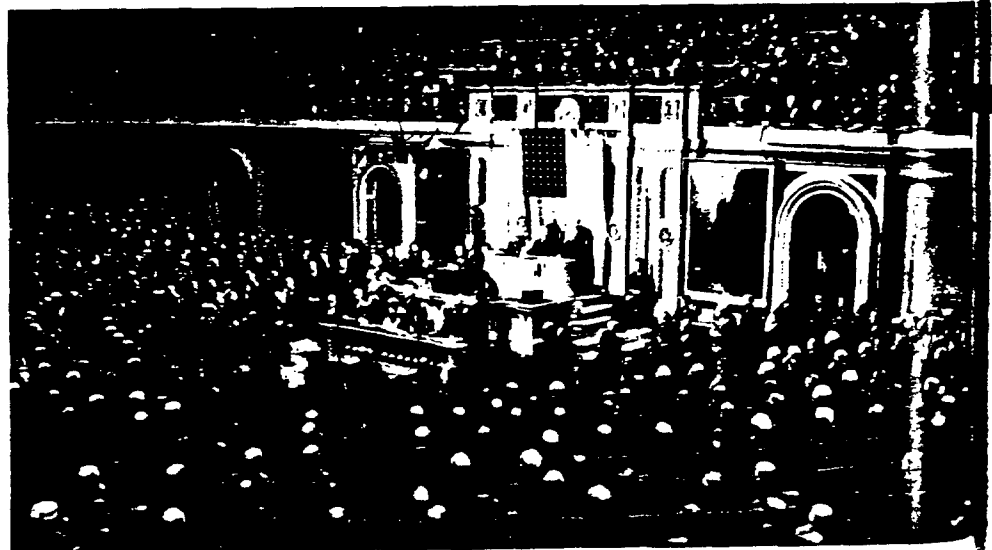
23 percent than to the maximum 27½ percent.)

There are several things about percentage depletion that its opponents often overlook: (1) It applies—besides oil and gas—to virtually all resources—coal, lead, copper, and even sand and gravel, to name a few; (2) In the oil industry, it applies only to *production* and not to refining, transportation, marketing, or any other operations; (3) It applies only to oil and gas actually produced and sold and cannot be used in the case of non-productive wells no matter what the cost of drilling them may have been; (4) It does not apply to the total value of the assets—the subsurface oil. No matter how long a well continues to produce, the total deduction over the years cannot amount to more than 27½ percent of the gross income from all the oil produced from that well.

While percentage depletion legislation for oil and gas was enacted some 33 years ago, time and experience have proven its importance and value. Many Congresses have reconsidered it, but in every instance they have reaffirmed the principle of depletion and the rate and method of computing it.

Depletion has made it economically practical for the industry to continue the search for oil in spite of the high rate of exploration failures. An unending search for and discovery of oil is essential, of course, to meet present and future requirements of our oil-gear economy.

Further, the discovery and production of oil in sufficient quantities has made it possible for the in-



Depletion and the method of computing it have been reaffirmed by many sessions of Congress.

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dustry to provide an expanding list of high quality petroleum products at reasonable prices.

Even with present and future demands for oil definitely established, there still are shortsighted individuals who would abolish percentage depletion, or slash the rate to as little as 15 percent.

Grave Consequences

The consequences of such a move, first to the oil industry, but quickly to the country and all its people, would be grave. Without this tax provision to encourage the search for elusive oil against long-shot odds, the immediate result would be a sharp curtailment in petroleum exploration. No longer would individuals and companies be able to seek oil with the knowledge that if and when they found it, they could recover part of their heavy expenses.

A drop in drilling activity would mean a drop in proved reserves. Historical records indicate that the nation's level of reserves fluctuates with the amount of drilling taking place.

Ultimately, a reduction of available oil supplies would certainly result in higher consumer prices for petroleum products. With an increasing population using more oil, and that oil becoming less and less available, prices would have only one way to go—UP.

One estimate is that motorists eventually could have to pay up to five cents more for each gallon of gasoline if the 27½ percent depletion rate were abolished. #



A healthy oil industry is needed to supply the growing requirements of an alert and powerful national defense.

Actions Speak Louder . . .

A wide understanding of the importance of percentage depletion is needed throughout the oil industry and among the general public. But that is not enough. Elected government representatives who are charged with the enactment of legislation controlling percentage depletion should be informed—not only of its importance, but of your feelings about it. On this, as on all major national questions, you are urged to write your United States senators and representative. See "Yes or No?—Let Them Know," on pages 4 and 5 of this issue of ETHYL NEWS.

—The Editors



Congress.



Ample supplies of oil make a wide variety of products available at reasonable prices.

Want to influence legislation?
Get in touch with your elected
government representatives

Yes or No? Let Them Know

WHEN ABRAHAM LINCOLN spoke of government of, by and for the people, he was referring to government that effectively *represented* the people; government that reflected their opinions, their feelings and their wants.

Such government is still the goal—but times have changed. Government has grown big and complex. Each elected official represents thousands of people. The volume, importance and complexity of legislation he has to keep up with is staggering. Only occasionally can he get out and talk with the people. Even then, he sees only a few.

But to act and act intelligently on public issues—to *represent* his constituents—the public official must know how they feel.

At the other end of the line, every citizen has a responsibility to communicate with his elected representatives—to let them know how he feels about the issues of the day—and why.

Government officials may have their differences about many things, but on one point they agree: It's important and helpful to them to hear from the voters back home—especially on current major legislation. They not only want to hear from the people, they are guided by the people's opinions. Sen. John L. McClellan, of Arkansas, emphasized

this point in a recent speech before the Economic Club of New York.

In spite of the importance of doing so, few people ever communicate with their elected representatives. In March of this year, for example, President Eisenhower spoke to the nation over radio and television about American preparedness in the face of the Berlin crisis. The next day, the White House was able to report the receipt of only about 600 telegrams. Upwards of 50 million people are estimated to have heard the President, but only 600 took the time or trouble to tell him how they felt about a question on which the peace and future of the whole world hinges.

That's the usual pattern—voters not taking the time or trouble to communicate with their elected government officials. Often they have definite opinions on vital issues. They spend lots of time telling their neighbors, friends and business associates about them. But only rarely do they do anything that can get any real action.

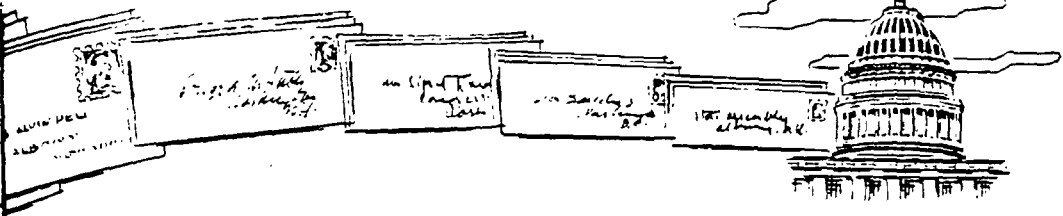
If they want to influence legislation, communicating with their representatives in government is the way to do it. By contacting them, the individual voter can directly influence the actions of officials at all levels of government:

- the President, senators and representatives on the national level;
- the governor, senators and members of the legislature on the state level;
- the mayor and councilmen on the local level.

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What's the best way to communicate with elected officials? Writing letters, sending telegrams and appearing at public hearings are all good.

Sometimes, intelligent, interested voters fail to communicate, even when they want to, because of the mystery or lack of understanding that surrounds what actually is a very simple procedure. Writing to a government official is pretty much like writing anyone else, but a few hints may be helpful. Some that the League of Women Voters of the City of New York suggests are:

- Letters will get more attention than post cards. They should be legibly written on one side of the page only, with the name and address of the sender at the top of the page.
- Letters should be limited to one subject and should be as brief as possible.
- They should be objective and should give the writer's reasons for his opinions.
- The letter should be written in the sender's own words. An original letter carries far more weight than a form letter.
- Criticism, when offered, should be constructive. On the other hand, when the writer approves of his representative's actions, he should not forget to compliment him.

Those who don't know the names of their elected representatives can readily obtain them by visiting, writing or telephoning the local office of one of the major political parties or of the League of Women Voters.

When it comes to forms of address used in writing government officials, there are no rigid rules. Most style manuals list various acceptable forms. Some that have been suggested are listed in the accompanying box.

But no matter what form of address is used, the important thing is to write! #

Forms of Address

PRESIDENT

The President of the United States Dear Sir:
The White House Mr. President:
Washington, D. C. Dear Mr. President:

VICE PRESIDENT

The Vice President of the Dear Sir:
United States Mr. Vice President:
The Capitol Dear Mr. Vice
Washington, D. C. President:

CABINET MEMBERS

Honorable Charles Coe Dear Sir:
Secretary of Defense Dear Mr. Secretary:
Washington, D. C.

U. S. SENATOR

Honorable Donald Doe Dear Sir:
United States Senate Dear Mr. Senator:
Washington, D. C. Dear Senator Doe:

U. S. REPRESENTATIVE

Honorable Frank Foe Dear Sir:
House of Representatives Dear Mr.
Washington, D. C. Representative:
Dear Mr. Foe:

(A representative should not be addressed as "Congressman")

GOVERNOR

Honorable George Goe Dear Sir:
Governor of (State) Dear Mr. Governor:
State House Dear Governor Goe:
(City) (State)

STATE SENATOR

Honorable Howard Hoe Dear Sir:
(State) State Senate Dear Mr. Senator:
(City) (State) Dear Senator Hoe:

MEMBER OF STATE LEGISLATURE

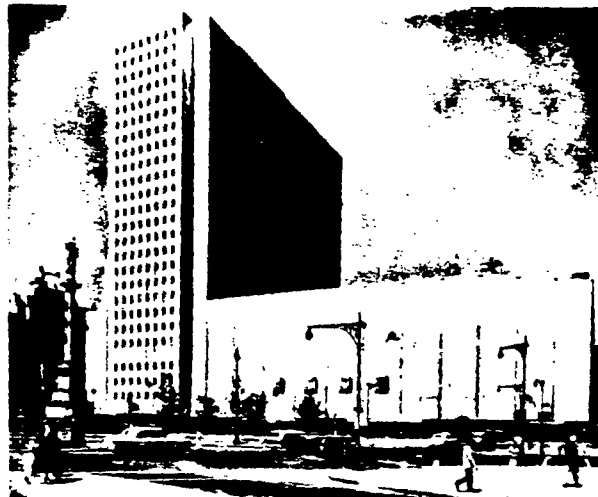
Honorable Lawrence Loe Dear Sir:
(State) State Legislature Dear Mr. Loe:
(City) (State)

MAYOR

Honorable Paul Poe Dear Sir:
Mayor of the City of (City) Dear Mr. Mayor:
City Hall Dear Mayor Poe:
(City) (State)

ON STAGE

at New York and



Ethyl in the World Petroleum Congress and International Petroleum Exposition

ETHYL CORPORATION is an active participant in two significant international oil gatherings being held in the United States this spring. The Company is taking part in the International Petroleum Exposition, at Tulsa, May 14-23, and the Fifth World Petroleum Congress, in New York, May 30-June 5.

At the World Petroleum Congress, some 6,000 scientists and technologists will gather in New York's giant Coliseum for 100 technical sessions. They will present their findings in various areas of research and discuss the application of this research to the industry's worldwide operations.

Starting two weeks earlier, at Tulsa, the International Petroleum Exposition presents a complete display of exploration, production, drilling, transportation and refining equipment. The expected crowd of 30,000 oilmen and government representatives who buy, specify and use equipment and services and a half-million of the general public are seeing more than \$500 million worth of such equipment displayed by almost 1,500 exhibitors.

Ethyl's participation in the World Petroleum Congress includes presentation of a technical paper, a display at the Congress exposition and a special tour of Ethyl Corporation Research Laboratories for those in attendance. Also, several of the Company's bi-lingual and multi-lingual employees will help staff the Congress.

Scheduled for presentation before a section of the Congress devoted to the Utilization of Petroleum Products is the Ethyl paper, "Antiknock Compounds—Research, Development and Refinery Application," by H. J. Gibson, W. B. Liggett and T. W. Warren, of the Company's Research Laboratories in Detroit.

The paper will point out the past, present and future economic importance of tetraethyl lead in gasoline and engine progress and in the conservation of petroleum resources. It will describe research and development work Ethyl has undertaken to provide new commercial antiknocks. It will tell how, as a result of the synthesis and screening of hundreds of compounds, the methyl derivative of cyclo-

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pentadienyl manganese tricarbonyl, presently called AK-33X, was selected for development and testing.

Ethyl will be one of 250 to 300 companies serving the petroleum and petrochemical industries that will have an exhibit at the Congress exposition. The exhibit will feature a scale model of the Company's manufacturing plant at Baton Rouge, La., the largest antiknock compound production center in the world. A slide presentation and colorful maps, illustrations and literature will point out and explain the complete manufacturing, delivery and technical services Ethyl USA offers refiners throughout the world. Ethyl representatives will be on hand at the exhibit and at the Company's headquarters at the Waldorf-Astoria Hotel to provide additional information.

The special tour on which the Ethyl laboratories are included runs from June 9-12. It is one of several that will provide an opportunity for Congress members to visit field installations and scientific projects throughout the country. Besides Ethyl, it takes in the Ford Motor Company's research laboratories and Rouge assembly plant, the research laboratories of Standard Oil Company (Indiana),

Universal Oil Products and Sinclair Research Laboratories, Inc.

The Ethyl Corporation display at the International Petroleum Exposition in Tulsa is one of the most unique at that immense gathering. In keeping with the IPE's and the oil industry's observance of 1959 as petroleum centennial year, Ethyl is displaying a number of rare items from the Company's collection of Petroleum Americana.

Included in the collection are mementoes from the very earliest days of the oil industry—some of them the only known copies in existence. They throw revealing light on oil operations and show how they were conducted in the years immediately after the Drake well. Others of the items even predate the industry's birth.

Most of the collection is in the form of printed materials. It includes advertising circulars, leases, stock certificates, books, maps, newspapers and magazines, pamphlets, reports, and even sheet music and dime novels.

These historically significant items are displayed in specially constructed cases that permit close examination by visiting oilmen. #

New Horizons for

by J. D. Bartleson, Sales, and R. W. Geiger, Business Research
Ethyl Corporation

OILMEN'S INTEREST IS ACCELERATING in the new antioxidant chemicals being produced by Ethyl Corporation as additives to stabilize and preserve desirable properties of fuels and lubricants. Industries like rubber and plastics are finding the "Ethyl" antioxidants useful for similar purposes too.

So far, some 60 oil companies in the United States, Canada and countries overseas are using "Ethyl" antioxidants in their finished petroleum products. Close to 200 other refiners and marketers are pushing evaluation studies. So are 100 companies utilizing chemical reactions in a wide variety of manufacturing processes.

Ethyl is now making eight antioxidants in commercial or development quantities. Scores of similar products are being created in smaller amounts for experimental purposes. Finding new and improved antioxidants is part of the Company's continuing research and development program.

Promise Versatile Utility

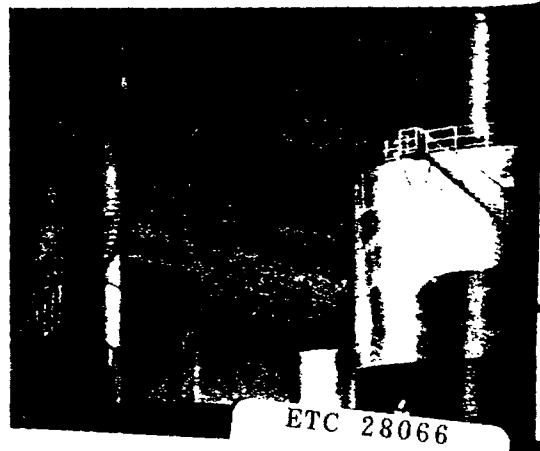
As intermediates, these chemical agents offer promise of versatile utility in the manufacture of dyes, pharmaceuticals, cosmetics and in the preservation of foodstuffs. Other likely applications are in making synthetic resins, resin plasticizers, surface-active agents and perfumes.

All members of Ethyl's newest chemical family stem from a process known as ortho-alkylation, discovered in Company research laboratories. It is responsible for the first commercial introduction of many reactive derivatives of phenol and aniline.

The parent product is "Ethyl" Antioxidant 701, with the chemical designation of 2,6-di-*tert*-butylphenol. Most of the others are derived from this basic compound.

As an additive, 701 reduces gum formation during the storage of gasoline and jet fuel. By comparative tests, it retards gum accumulations more effectively than certain competitive antioxidants. It also inhibits decomposition in most kinds of gaso-

The new "Ethyl" antioxidants are useful, among other places, in aviation fuels and lubricants; in automotive gasolines, crankcase oils and trans-



s for Antioxidants

Unique Ethyl compounds gain more applications as product improvers

line. Cleanliness is noteworthy in engines using fuels containing 701.

Of the Company's other related products, "Ethyl" Antioxidant 702 is an agent to give familiar lubricants desirable properties. Its most widespread use, on the basis of current experience, is seen in crankcase oils. As a controlling medium, scuffing-type piston ring wear is minimized when the additive is used alone in lubricating oils or in combination

mission fluids; in railroad diesel engine lubricants; and in reducing gum formation and decomposition of petroleum products in storage.

with commercial sulfonate and phenate detergents.

A particularly advantageous property, unequalled by other types of antioxidants, is the way 702 withstands high temperatures. It has low volatility, does not create sludge or varnish, and is highly stable.

Results similar to those achieved with 702 in lubricating oils are found when the compound is added to automatic transmission fluids. It prevents critical acid accumulation and excessive viscosity. By improving the cleanliness of transmission parts, it extends their service life.

Heavy-Duty Uses

Other uses for the product are in lubricants for railroad diesel engines, so that bearing corrosion is checked. It stabilizes oils for heavy-duty equipment like bulldozers, cranes and drilling rigs, and industrial oils used in circulating systems and steam turbines.

A third compound, "Ethyl" 703, combines the desirable properties of an effective, temperature-stable antioxidant and a surface-active amine. The additive reduces changes in the chemical and physical properties of lubricants during their storage and use.

Evaluations of "Ethyl" 703, conducted by the Wright Air Development Center at Dayton, Ohio, have established the compound's military importance. It more than doubles the storage life of synthetic jet engine lubricants, therefore extending their usefulness at considerable cost savings. Oils containing 703 have passed severe, full-scale engine



tests, and the additive is now an ingredient of all kinds of jet lubricants supplied to the Air Force.

Another agent, "Ethyl" Antioxidant 712, has applications much the same as the Company's 702—in crankcase oils, automatic transmission fluids and in lubricants for heavy-duty equipment. It differs primarily from its companion product by withstanding even higher temperatures.

Widespread Acceptance

Because of its high degree of effectiveness and economy, "Ethyl" Antioxidant 733 has won widespread acceptance as a stabilizing additive for high octane gasolines.

Present customers have expressed complete satisfaction with the product on all counts. In some cases, savings up to 50 percent are being realized with the substitution of 733 for competitive antioxidants.

It is tailored especially to give high octane gasolines increased ability to withstand prolonged storage without decomposing or accumulating excessive gum. When 733 is added to gasolines, engine cleanliness is exceptional.

For purposes other than in fuels and lubricants, "Ethyl" antioxidants are available to manufacturers of rubber and plastics products. These ortho-

alkylated phenols are not only effective stabilizers, but are being offered at sizable cost advantages over competitive agents.

Each compound in this group of Ethyl products reduces cracking and degradation of natural and synthetic rubber. Most leading producers and fabricators in the United States are directing attention to the antioxidants' potentials. "Ethyl" 702, 720 and 762 are considered particularly promising.

The additives give greater durability to finished articles like tires, battery cases, belting and other industrial rubber materials. Similar improvements occur in foam mattresses, pillows, flooring, hose, insulation and other rubber goods.

"Ethyl" Antioxidants 702, 720 and 736 have the additional capacity to make such plastics as polyethylene and polypropylene more stable, and therefore increase their durability. Already having countless uses in a variety of important products, these plastics can have more applications triggered by antioxidants like the ones Ethyl is making.

Still other potentials for the Company's ortho-alkylation products await considerable development. Some of the most promising are as chemical intermediates or building blocks. These prospective applications indicate that the antioxidants have virtually unlimited horizons. #

Finished products made of rubber and such plastics as polypropylene and polyethylene may be made still more durable through the use of "Ethyl" antioxidants.



In connection with the
industry's Centennial,
Ethyl is making available
an illustrated presentation on . . .

THE EARLY DAYS OF OIL

TURNING BACK the calendar to the dynamic and colorful beginnings of petroleum, Ethyl Corporation has produced an illustrated presentation entitled "The Early Days of the Oil Industry." Available in slide and film strip form, with accompanying script, the show is being offered to oil companies for use during the Oil Centennial.

In starting before the birth of the modern oil industry, the presentation traces developments leading up to the Drake well. It highlights outstanding developments and important characters in the drama of petroleum's first decades. Illustrations are from Ethyl Corporation's collection of *Petroleum Americana*, one of the most complete of its kind.

"The Early Days of the Oil Industry" tells of Samuel Kier, the Pennsylvania entrepreneur, whose salesmen hawked petroleum in the 1840's as a medicine which would make "the lame to walk and the blind to see." It pays tribute to Benjamin Silliman, Yale University professor whose report encouraged investors to form a company to drill the first oil well.

After presenting Drake and his discovery well at Titusville, succeeding illustrations and the script cover highlights of the crude drilling and refining methods of the 1860's, the first storage tanks and pipelines, and scenes of booming activity in western Pennsylvania.

Because men always make an era, the presentation includes such pioneers as Colonel E. A. L. Roberts, inventor of the oil well torpedo, and John Wilkes Booth, whose wells at Franklin, Pa., cost him more than he made from them. There also are representative examples of oil country pictures taken by John Mather, the industry's first important photographer, reflecting the bustling activity of oildom's early life and times.

Rare Book Shows

Documents and publications shown range from contemporary posters, advertisements and leaflets to early books. Among them is Thomas Gale's rare volume, "The Wonder of the Nineteenth Century: Rock Oil in Pennsylvania and Elsewhere." Others are dime novels about heroes like Fred Fearnot putting villains to rout, succoring maidens in distress and winning fame and fortune through good deeds made possible by oil's bounty.

Whether shown to oil industry audiences or to the public, "The Early Days of the Oil Industry" provides informative insight into the birth and early progress of the 100-year-old industry—especially in contrast to the complex and efficient operations of today.

Copies of the script and slides or film strips making up the 25-minute presentation are available through Ethyl's regional and district offices. #

Typical wagon riders were B. G. Henry and Guy L. Tate, retired Magnolia Petroleum vice president, and their families.



Frontier days come alive for
Texans who pay homage to the
state's pioneer ranchers by . . .



Enthusiastic teen-agers like this Salt Grass trio pitched tents and set up cots each night on their way to Houston.



ETC 28070

by Stanton P. Nickerson

TELEVISION DRAMAS, moving pictures and western stories may recapture frontier days vividly enough for most people, but hardy Texans prefer the real thing, experienced first hand.

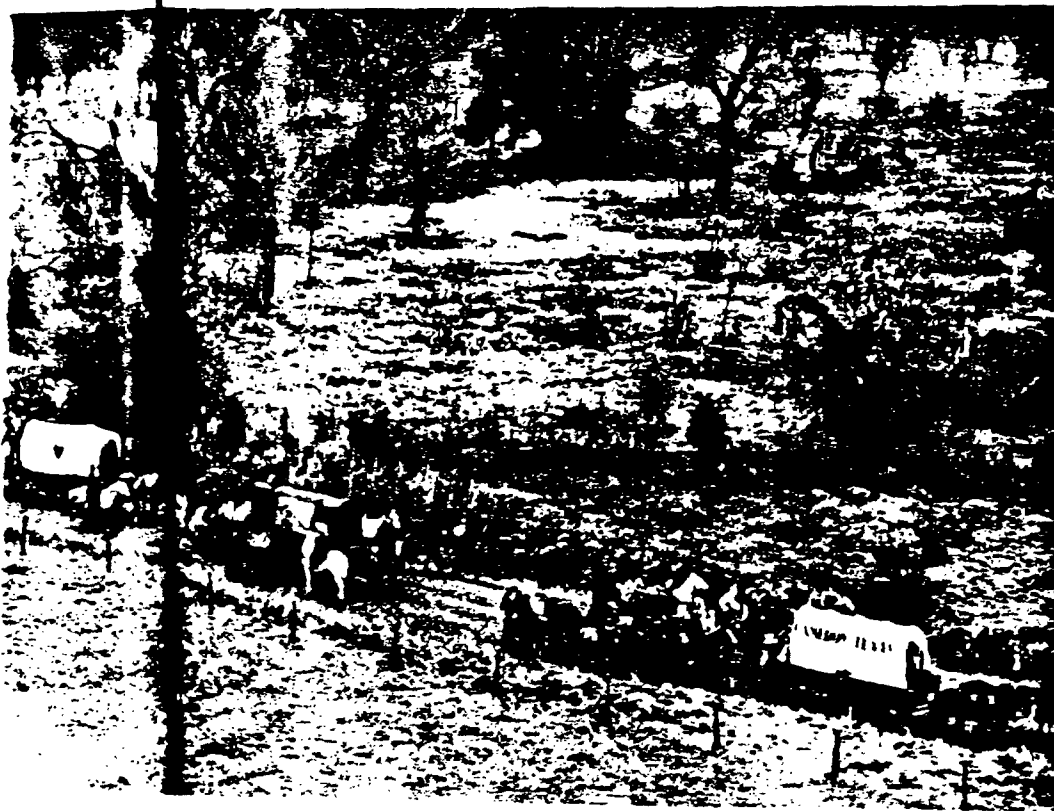
That is why so many of them can hardly wait for the annual Salt Grass Trail ride across 75 miles of open countryside and into Houston. Today's comforts and conveniences are forgotten in the adventuresome novelty of traveling by covered wagon and horseback.

Sponsored by the Salt Grass Trail Association, the cavalcade follows much the same route taken by early Texas ranchers almost a century ago. That was when the first longhorns were driven from dry inland ranges to lush salt grass pasturelands near the Gulf Coast.

After grazing on mineral-rich forage, cattle became healthier and heavier, and commanded top prices in expanding eastern markets. In this way, original Salt Grass Trail riders touched off the state's first boom—in livestock.

Modern Salt Grass Trail participants commemorate what these pioneers did for Texas prosperity, and at the same time set the stage for Houston's yearly Fat Stock Show and Rodeo. Their reenactment has become the largest organized movement of animals and people taking place regularly. Some 1,800 men, women and children from all walks

The Salt Grass Trail



Traveling in covered wagons and on horseback, Salt Grass Trail riders duplicated seasonal migrations of Texas cattlemen to greener pastures a century ago.



Scouts carrying United States and Texas flags added color to the cavalcade as it passed through towns between Brenham and Houston.

of life made this year's trek unusually colorful.

Following a pattern established when Salt Grass Trail rides were revived in 1952 by a handful of enthusiasts, 78 covered wagons and some eight hundred mounted riders started before dawn on a mid-February Sunday from the cattle center of Brenham. The procession terminated four days later after a downtown Houston parade, where thousands of spectators cheered the unique spectacle.

Each leg of the journey was directed expertly by Trail Boss Reese Lockett, Brenham mayor, and his staff. Routes, chuck-wagon lunch stops and overnight campsites were pinpointed in advance.

All riders brought their own food and equipment, but animals' needs were supplied from mobile units, including a blacksmith shop.

Holiday excitement sparked the procession from its beginning. Riders were rewarded for months of anticipation by sharing a common adventure, the camaraderie of trail and fireside, and the satisfaction of successfully overcoming hardships.

Not even leaden skies and seasonal downpours dampened the general enthusiasm. An occasional tenderfoot may have wished for an upholstered car seat instead of a wagon's spine-shattering jolts or a chafing saddle, but such discomforts were

Taking good care of Dobbin was essential on the 75-mile ride. A blacksmith set up his forge at each overnight stop. Horses were watered at ponds and streams en route.



ETC 28072



Sizzling steaks from campfires appeased riders with appetites whetted by their unique venture.



Riders Thomas Gillen, Ethyl, and Sidney Latham, Hunt Oil vice president, feed a horse.

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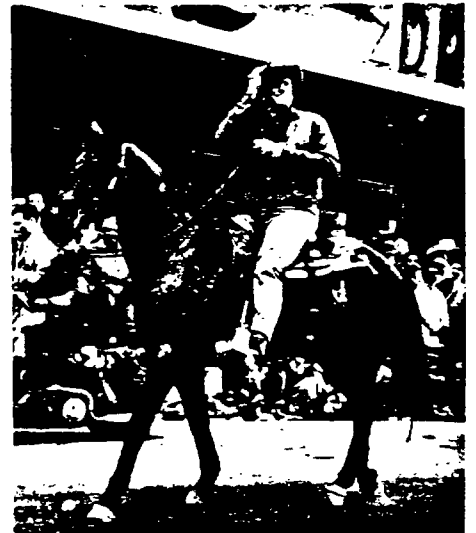
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chased away by the aroma of barbecued steaks and the fun of singing together as the sun went down.

After camping out the last night at Houston's Memorial Park, riders curried their horses and mules and changed into fresh costumes. Warm sunshine added its welcome as they paraded into Houston and through the city's business section.

As a concession to the Twentieth Century, this year's honorary trail boss was rangy Jim Arness, better known as Marshal Dillon on the television show, "Gunsmoke." Youngsters yelled hero-worshipping acclaim as he rode past. #



Above, Honorary Salt Grass Trail Boss Jim Arness, better known as Marshal Dillon on the TV show "Gunsmoke," waves to adulating youngsters in Houston. . . . Left, a prairie schooner was authorized by the Postmaster General to carry mail.



Celebrations

• TITUSVILLE

The oil industry's birthplace
will be the scene of colorful events
marking its 100th anniversary

JUST AS IT DID a century ago, the dateline "Titusville, Pa.—" will appear in news reports around the world often this year. One hundred years ago, it preceded exciting accounts of the discovery of oil and early developments in the booming young industry. Now, it will identify the locale of a series of colorful events marking the oil industry's Centennial.

Titusville, the birthplace of the oil industry, is the center of a giant birthday celebration—a central group of activities through which the eyes of people everywhere will be focused on a century of oil progress. In and around that western Pennsylvania community, Centennial events, starting with the observance of Colonel Drake's birthday, have been taking place since early April. They will in-



Drake Well Memorial Park will be the focal point of several of the Centennial activities.

crease in frequency and scope over the next few months and reach a climax with a full program of activities during Colonel Drake Week, August 23-29.

Oil Centennial, Inc., a volunteer organization of oilmen and other business and civic leaders, is sponsoring Centennial events in the Titusville area. J. P. Jones, president of the Pennsylvania Grade Crude Oil Association, is chairman of the group and Ned H. Dearborn, former president of the National Safety Council, is president.

Among the more outstanding activities preceding Colonel Drake Week are:

• SALUTE FROM OIL STATES—Addressed to Gov. David L. Lawrence, of Pennsylvania, greetings from the governors of all other oil producing

n of a Century

Right, officers of Oil Centennial, Inc., include J. P. Jones, Pennsylvania Grade Crude Oil Association president; Ned H. Dearborn, former president of the National Safety Council; and Harry A. Logan, Jr., president of United Refining Company.



states will speed hundreds of miles through oil pipelines to Titusville. This will be the first time that written messages have ever been transmitted by oil pipeline.

• **PIPELINE MONUMENT**—In a special ceremony arranged by the API Division of Transportation, a monument commemorating the world's first oil pipeline will be unveiled at Drake Well Memorial Park.

• **PRESIDENTIAL MESSAGE AND PROCLAMATION**—An expected letter from the President of the United States will pay tribute to the Centennial Year celebration. In addition, steps have been taken to have the President issue a proclamation declaring August 27 to be Oil Centennial Day.

• **COLONEL DRAKE WEEK**—August 23-29 will be officially proclaimed Colonel Drake Week by Governor Lawrence.

• **DISCOVERY WELL #2**—Approximately two weeks before Oil Centennial Week, drilling will start on a new oil well in Drake Well Memorial Park in Titusville, site of the original discovery well.

Since the actual one hundredth anniversary of the discovery of oil is August 27, an entire week of events has been planned for the period of August 23-29. This will provide an almost uninterrupted program of activity for the citizens of Titusville and the surrounding area and for the thousands of oilmen, government leaders and other guests expected to pour into the area.

Highlights of Centennial Week of particular interest to oilmen will include:

• **SECOND CENTURY OF OIL CONCLAVE**—Oil's second century will be ushered in by a roundtable

discussion of nationally and internationally prominent scientists, statesmen and industry leaders.

• **MESSAGE TO A.D. 2000**—A time capsule containing significant documents and memorabilia will be buried at the site of the world's first oil well and set to reopen in the year 2000—its contents consigned to the next century.

• **COMMEMORATIVE STAMP**—Special equipment will be set up in Titusville by the United States Post Office Department to handle requests for first day covers of an Oil Centennial commemorative stamp on Oil Centennial Day.

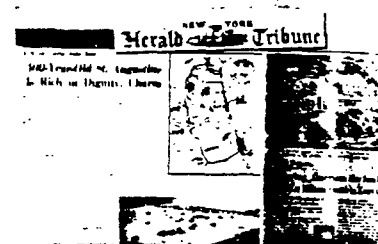
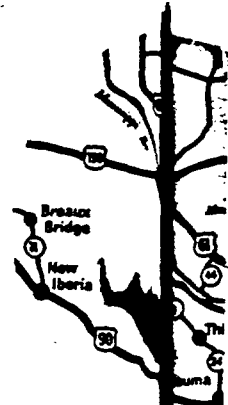
• **100-YEAR KEYNOTE**—On Oil Centennial Day, an outstanding national figure will deliver an address which will keynote the next 100 years of oil.

In addition, concerts, parades, fireworks displays, art exhibits, displays of Petroleum Americana, athletic contests, social events, pageants and youth activities have been planned.

Oilmen serving as committee chairmen in connection with various Centennial events are: Harry A. Logan, Jr., president, United Refining Co.; J. B. Fisher, president, Kendall Refining Co.; G. S. Patterson, president, Buckeye Pipe Line Co.; W. F. Clinger, independent producer, Warren, Pa.; Donald C. O'Hara, National Petroleum Association; A. W. Scott, president, Wolf's Head Oil Refining Co.; F. O. Koontz, president, Quaker State Oil Refining Corp.; A. W. Clinger, vice president, Pennzoil Division, South Penn Oil Co.; and Charles L. Suhr, board chairman, South Penn Oil Co.

Ernest C. Miller, vice president, West Penn Oil Co., is serving as historical consultant and Thom Yates, Ethyl Corporation, is serving as public relations consultant. #

Expanding the Magic Circle



Broader campaign is designed to increase sales of service station products

A BROADER AND BETTER Magic Circle campaign, employing national newspaper publicity and magazine advertising, is under way to stimulate increased use of the family automobile. Sponsored by Ethyl Corporation as a service to the oil industry, it is designed to get motorists everywhere to use their cars more for pleasure travel. The ultimate goal, of course, is increased sales of gasoline and other service station products.

The publicity phase of the campaign is the new Magic Circle Travel Clinic. This is a unique weekly news and feature service for leading newspapers in towns and cities throughout the country. Articles prepared for use in editorial space describe Magic Circle tours around a different city each week. Specially designed picture maps and photographs accompany each article.

To strengthen the appeal to get out and use the family car, new elements of these stories nail down the point that no matter where the reader lives, he too is in the middle of a fascinating Magic Circle.

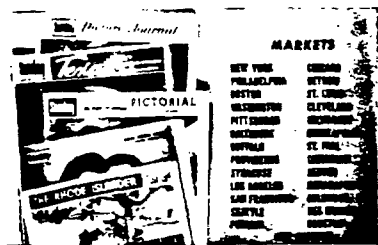
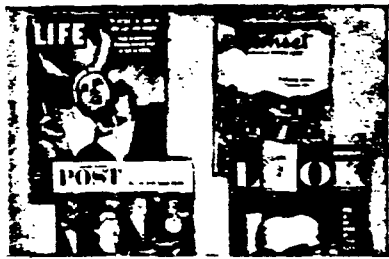
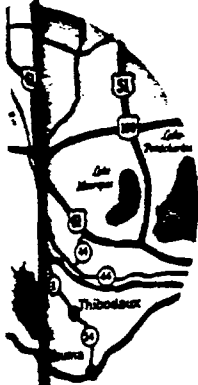
The Travel Clinic was started in 1958. By the

end of the year, well over 100 of the leading newspapers in the country were running its articles quite regularly.

For 1959, the Travel Clinic has been expanded. Areas throughout the country—all of them important gasoline markets—are being written up. By the middle of the year, it is expected that Travel Clinic articles will be running regularly—as an editorial feature—in at least 140 major daily newspapers.

The second phase of the Magic Circle campaign—complementing the Travel Clinic—is the national advertising program. It is built around colorful ads that urge the public to get out and enjoy the wonderful things there are to see and do by automobile.

All the ads make the point that “your car makes any map a Magic Circle.” They talk about specific locations—Louisiana’s Bayou country, Indiana’s Hoosierland, the Pacific Northwest—not only in terms of what can be found there but also in terms of what motorists everywhere can find in their own locales.



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Magic Circle advertisements in national magazines this year cover the Philadelphia, Atlanta, Indianapolis, Chicago, Kansas City, Tulsa, Baton Rouge, Seattle and San Francisco areas—plus a special one on the pioneer oil territories in connection with the Centennial. They first appeared in March and will continue through the major driving seasons. They are being seen in *Saturday Evening Post*, *Look*, *Life* and *Sunset*.

Localized Magic Circle advertising that fits right in with the national newspaper publicity and magazine advertising programs also has been scheduled. It is appearing June 7 in the Sunday newspaper supplement called *Sunday in 27* of the biggest markets in the country. Each one of the 27 messages will talk about the things to see and do—by car—right in the reader's own area.

Besides motorists in general, the Magic Circle campaign also shoots for special groups of prime gasoline users—hunters and fishermen, for example. In this connection, two-page advertisements are appearing in four issues of *Sports Afield*—two

on fishing in April and May, and two on hunting in September and October.

Each of the ads covers eight major fishing or hunting localities, but also makes the point that wherever he may be, the hunter or fisherman should get into his car and try out new places.

A third and particularly unique part of the Magic Circle campaign is a special seven-page promotion in the April issue of *Charm*, one of the top fashion magazines. Presented in cooperation with Saks Fifth Avenue, a leading fashion store with branches in a number of major cities, the promotion shows the ladies what to wear while they are out—in the car—enjoying the fun to be found in their Magic Circle.

The whole thing is based on the established fact that women have a lot to say about how and why the family car is used.

This, then, is the Magic Circle campaign for 1959—the program Ethyl is sponsoring to help the oil industry increase the sale of gasoline and other service stations products. #



Right, in its heyday, Pithole's Holmden Street saw crowds grow larger and more buildings put up every day.

PITHOLE

OF THE SEVERAL COMMUNITIES that sprang up as a result of the discovery of oil in northwestern Pennsylvania a century ago, none was more fabulous than Pithole City. Probably no other city in the entire country ever experienced such a rapid birth and demise—or left its mark so indelibly. Pithole was something that just *had* to be in a nation and an industry growing up.

It was in 1865 that destiny chose to keep its rendezvous with the “boomiest” oil boom town of them all. All in the span of two years, give or take a few months, Pithole was born, reached its pinnacle and died.

For 90 years, it remained dead and all but forgotten, except in oil history books. But now, thanks to the interest of one of the original oil region's public-spirited citizens, Pithole is again coming to life. It will never be the wild, woolly and wicked Pithole of yore. But neither will it become—as was happening—a useless hillside whose role in forging an industry and a nation is lost and forgotten.

In 1957, James B. Stevenson, publisher of *The*

A fabulous, but short-lived Pennsylvania boom

Titusville Herald, purchased the 89-acre tract where Pithole City once stood. He cleared out the hawthorn, ironwood and the other shrubs and trees that had overgrown it. By last summer the new Pithole was ready to welcome its first tourist. Some 4,000 found their way to the city of the past, 10 miles southeast of Titusville.

Pithole is a community disappeared. All that remains are outlines of the rutted, mud-packed streets and the cellar excavations of some of the larger buildings. But within the limitations of time, money and energy, Stevenson already has done much to bring Pithole back to life. No buildings have been restored. However, signs identify the location of vanished city's streets and most famous structures, so that one can wander about in proper orientation with the original Pithole.

With only a little imagination, the visitor can take himself back to January 7, 1865, when it all started.

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Left, a photograph taken at almost the same spot today shows only a trace of Holmden Street and its identifying signpost.

ERevisited

by Thom Yates

Pennsylvania boom town is being brought back to life

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At the time, this was practically wilderness except for two small farms that had been carved out by Thomas Holmden and his brother, Walter. Excitement was at fever pitch throughout the region following Colonel Drake's historic oil strike at nearby Titusville.

In what must be recorded as one of the classic wildcat ventures of all time, I. N. Frazier and James Faulkner leased that part of Thomas Holmden's farm that lay on the flat land along Pithole Creek, so named after the deep fissures, or "pits," in the rocks that overlooked it. What made their proposal to drill for oil there so speculative? Simply that, in those days, anybody who thought oil would be

Horse and wagon trips over the site where Pithole once stood start at owner James Stevenson's land office and souvenir shop.

found in the wild and inaccessible back hills was thought to be mad.

This did not faze Frazier and Faulkner. They formed a company and relied upon the ancient art of "dousing" to show them where to drill. When the discovery well came in, it flowed at 250 barrels a day. Three months later, another well of similar ca-





HOMESTEAD WELL, PITHOLE CREEK, PA.

capacity came gushing in at the rim of the Holmden farm.

That was all that was needed. The human stampede to Pithole City was on. Speculators, real estate operators, the poor hoping to get rich, the rich hoping to get richer—all these and more poured into the locale by the thousands. On foot and on horseback, in stagecoaches and in wagons they came, both by day and by night. New wells came in, too—almost daily—and the influx of humanity grew correspondingly. Soon the wells along Pithole Creek were producing 2,000 barrels a day—only a trickle today, but at that time one-third of the world's total oil production.

Buildings Up in Five Days

And as fast as a well went down, a building went up. Two-story wooden buildings were erected and readied for occupancy in only five days. By May, four months after the discovery of oil at Pithole, 20 streets had been laid out. At the main intersection of Holmden and First Streets was erected the Danforth House—one of 50 or 60 hostleries that were to rise in the city.

At its zenith Pithole also had two church buildings (two other denominations met regularly, but had no structures of their own), two banks, two telegraph offices, a daily newspaper, a water system, a fire company, all of the essential stores, machine shops and other businesses and scores of

boarding houses. The largest building was Murphy's Theatre, on First Street, which comfortably seated 1,100 patrons.

The social life of Pithole was, as one would expect, gay indeed. The choice of functions ranged from formal balls and concerts to strawberry festivals and church suppers. At the outset, despite its superficial roughness, Pithole was an orderly and law-abiding town. But it did not take long for the ruffians, drifters, gamblers and loose ladies to arrive on the scene. Whether these people added to or detracted from the social life of the city depends upon how one views the specialized activities of such people.

But it wasn't all leisure. Down on the flats below the city, men continued to seek and find oil. It was almost impossible to go wrong. Virtually every well that was sunk was a producer. Production became so voluminous (6,000 barrels a day) that it didn't seem to matter that some of the earliest wells had stopped producing.

Dead Wells and Big Fires

Even a sweeping \$1.5 million fire in October 1865 didn't disrupt life in the town too much. The residents did begin to take notice, however, when all through the following winter and spring other wells suddenly went dead and still other fires brought new havoc.

As fast as they had arrived, the people began

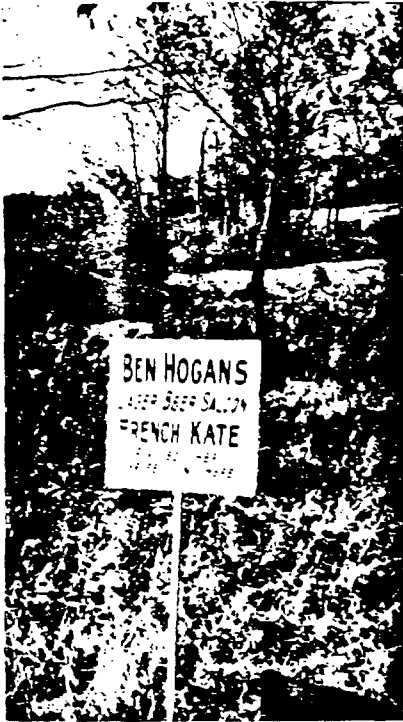
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In today's Pithole, explanatory signs point out the location of some of the outstanding places of interest that helped give the town a name throughout the young, but booming oil industry during the middle 1860's.



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to desert Pithole for more promising parts of the area. The daily newspaper continued publishing until 1867, but for all practical purposes Pithole was dead. By 1870, only a handful of the 15,000 population remained. A few years later, nothing but cellar holes and debris marked the site where one of the great bubbles of oil history had burst.

The rapid and complete downfall of the city can be seen in the fact that the Holmden farm, with its 96 wells, sold at Pithole's peak for \$2 million. Twelve years later, virtually this same land was bid in by the county commissioners for a paltry \$4.37.

There is almost as much to see of Pithole today as there was five years after the boom city was born. Besides strolling the marked streets and reading the signs noting where the major buildings stood, the visitor also can see Pithole oil still being produced. Down on the flats along Pithole Creek,

on land he now owns, James D. Berry, Jr., a director of Quaker State Oil Refining Corporation, keeps one of the original wells in operation. It produces a barrel or two of crude a day. Some is bottled and sold as a souvenir to visitors.

While Pithole is best remembered as a free-wheeling boom town, it made many solid and lasting contributions to the advancement of the oil industry. It was an invaluable proving ground for hundreds of drillers who gained experience there and then went forth to other oil fields. Pithole was significant, too, because it represented the first successful exploration for oil some distance away—even though only a few miles—from a proven field (Oil Creek, in this instance). Still another of Pithole's contributions was that it helped to solve many of the basic problems of early oil leasing, production, transportation and marketing.

Birthplace of Pipelines

More important than all the rest, Pithole was the birthplace of oil pipelines. In a perfect example of American ingenuity and free enterprise at work, the first pipeline was conceived and built to move a desired product to market in a more economical and dependable manner.

Pithole's early oil was hauled to the nearest rail-head, 5½ miles away, by horse-drawn wagon. The going rate was \$3 a barrel. The oil itself sold for \$6. Thus, the teamster, whose job admittedly was a tough one, was getting half as much as was the producer who had risked his all in finding the oil and bringing it out of the ground.

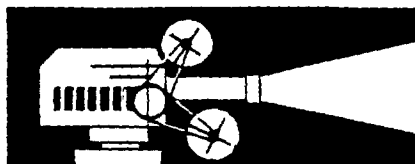
How to overcome this situation? Samuel Van Syckel had the answer. Over hill and through valley, and despite frequent violent attempts by the teamsters to disrupt the project, Van Syckel laid and operated a two-inch line to the railhead. The world's first oil pipeline reduced the cost of transporting oil to a more realistic \$1 a barrel.

As Pithole declined, Van Syckel's pipe was dug up and salvaged. But the trench remains visible along almost its entire course even to this day.

The romance, the glamor, the excitement and the drama of the original Pithole City can never be recaptured. But through his efforts, Publisher Stevenson hopes to be able—especially in this Oil Centennial year—to give tourists an idea of what Pithole was like and the lasting contributions it made to the oil industry. #

Use of "Ethyl" Multi-Purpose Additive Explained in Films

THE USE OF "Ethyl" Multi-Purpose Additive for Gasoline, a surface-active detergent to remove and prevent carburetor deposits and to prevent carburetor icing, is



explained in two new sound and color motion pictures produced by Ethyl Corporation. The latest additions to a kit of films dealing with the operation of the modern automobile, the films are entitled "Preventing Carburetor Deposits" and "Preventing Carburetor Icing."

The first motion picture discusses carburetor operation at idling, the presence of deposits in the throttle section and their effect on carburetor operation. It explains the nature and sources of de-

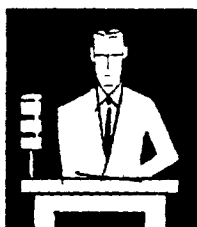
posits and their removal by the costly boil-out method. Finally, it shows how the detergent additive put into gasoline at a refinery removes and prevents deposits

during regular car operation.

In discussing carburetor icing, the second motion picture deals with engine stall due to icing in non-freezing weather, the cooling effects of throttle section vacuum and gasoline evaporation. It explains the climatic conditions leading to icing, the effect of volatility on icing, and the formation of ice on the throttle blade and consequent blocking of idling air flow. It concludes by demonstrating advantages of the compound in preventing icing. #

Chemists Present Papers at ACS National Meeting

THREE TECHNICAL PAPERS were presented by chemists from Ethyl Corporation's Research and Development department at Baton Rouge, La., before the 135th national meeting of the American Chemical Society in Boston in April.



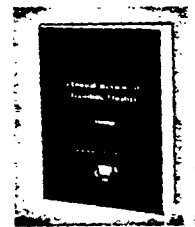
In the first, two new simple methods for making trialkylboranes—potentially useful as aircraft fuels and as chemical intermediates—were described by Dr. Eugene C. Ashby.

The successful synthesis of a new organic sodium compound, which shows promise as a chemical intermediate, was reported by D. O. DePree in the second paper. The compound is beta-sodio sodium methacrylate. It is of interest because of its unusual structure and surprising thermal stability.

In the third paper, Dr. E. C. Junege told of the successful preparation of a new class of chemicals—unsubstituted vinyl compounds of lead. He reported some of the chemical reactions which the vinyl lead compounds undergo and told of their physical and chemical properties. #

Annual Gasoline Facts Book Published for Fourth Year

THE FOURTH EDITION OF Ethyl Corporation's "Annual Review of Gasoline Quality" has been published this spring.



Covering the year 1958, the volume contains comprehensive data on octane numbers, hydrocarbon composition, volatility and other gasoline characteristics. These data are reported for the country as a whole, for geographical regions, and for the 57 cities which are regularly surveyed each month by Ethyl.

Other sections of the annual review discuss the calculated road antiknock performance of gasolines and the octane requirements of 1957 and 1958 model passenger cars.

Besides reporting on gasoline quality trends in the United States, the review presents extensive data on Canada and year-end octane values of gasoline sold in 21 other foreign countries.

A final section of the book presents annual values, extending back into the 1930's for octane number, sensitivity, vapor pressure, and distillation. #



EVEN IN THIS DAY of far-ranging rockets and satellites and advanced space exploration, a round-trip to the moon still remains in the future. But the equivalent distance—not of one, but of 16 round-trips to the moon—was traveled by cars and trucks participating in Ethyl Corporation road test programs last year. In such widely separated places as Michigan, California, Texas and Wisconsin, these vehicles piled up a total of eight million miles. Studies of their performance under all sorts of weather, road and traffic conditions provide valuable information which helps Ethyl make further contributions to fuel and engine progress.

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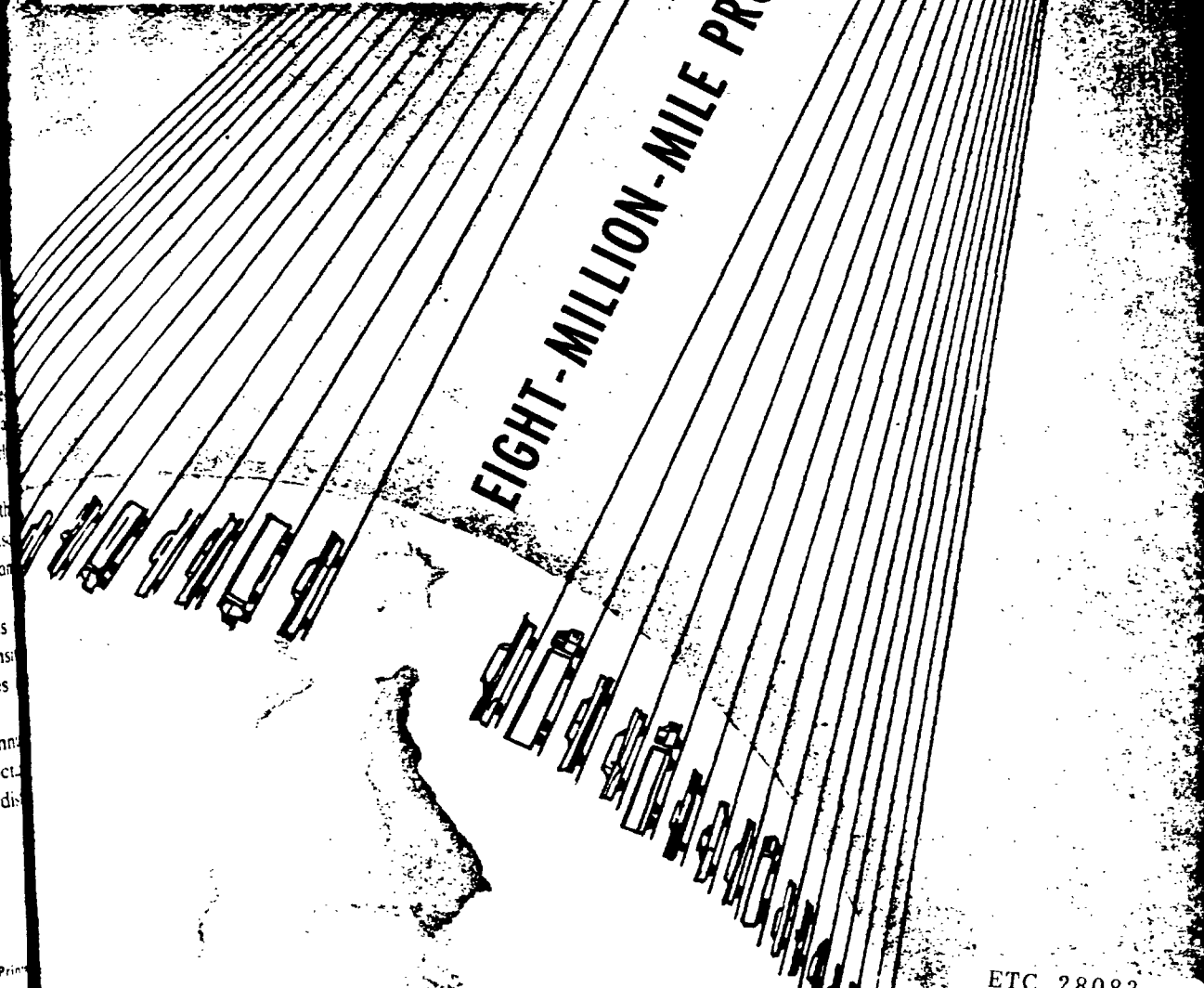
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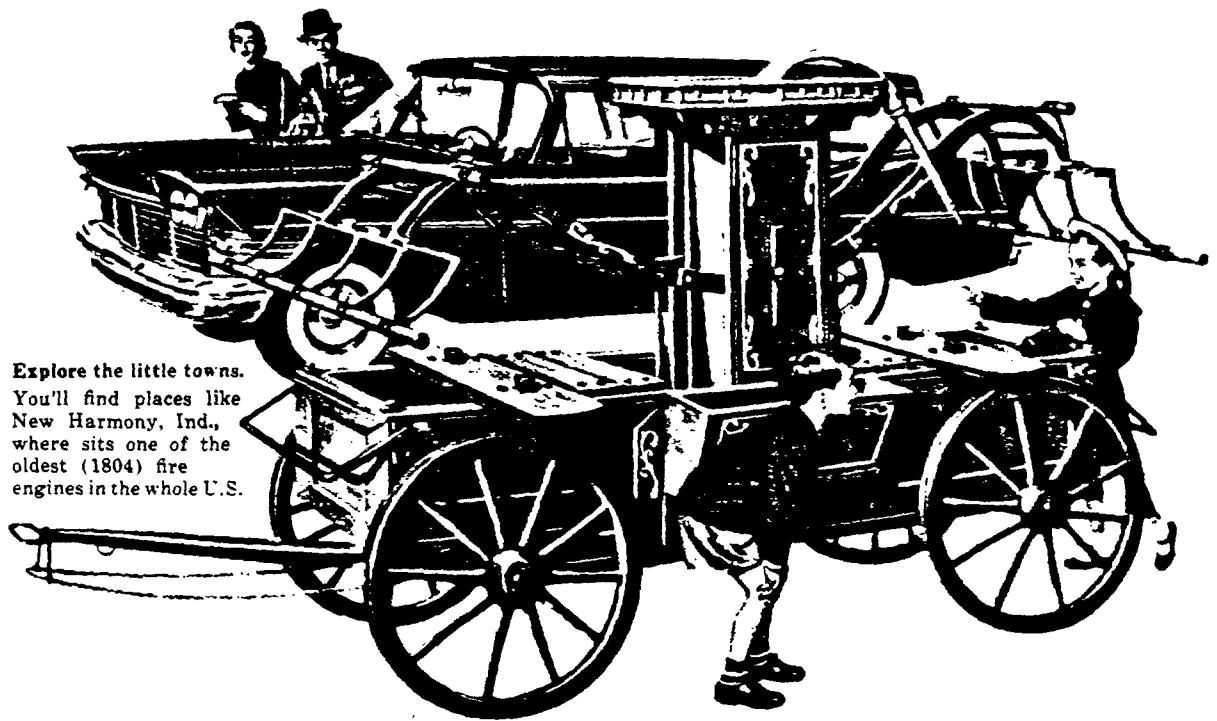
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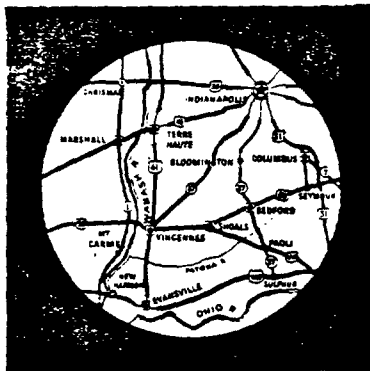
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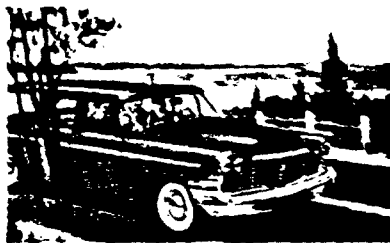
Explore the little towns. You'll find places like New Harmony, Ind., where sits one of the oldest (1804) fire engines in the whole U.S.

Your car makes any map a Magic Circle



This Hoosierland Magic Circle is simply an example—of the fun and pleasure that surround you anywhere you drive. Pick up a map—start exploring—you'll find your car is the best investment in fun you ever made.

Published by Ethyl Corporation, New York 17, N. Y. to help you get more enjoyment out of your car. Ethyl Corporation manufactures antiknock compounds used by oil companies everywhere to improve their gasolines and your driving pleasure.



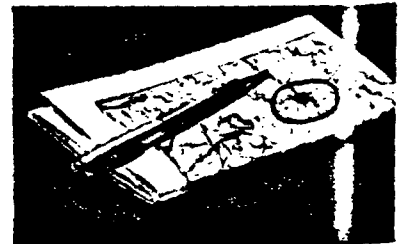
1. See what spring brings to your countryside. Hoosiers like to drive along their many famous rivers—the Ohio, the Wabash, the Patoka. In *your* area, head for the crooked little lines on your map.



2. Visit the shrines of the famous. The favorite of Hoosiers is the Indianapolis home of poet James Whitcomb Riley. Where *you* are, think of your area's most fabled person, then seek out his legend.



3. Turn off on the byways. In Indiana, as everywhere, they often lead to the biggest pleasures—and surprises. Off the beaten path, you'll find quiet country scenes worthy of picture postcards.



4. Take a pencil and map out your Magic Circle fun right now. You've got the car, and if you're missing out on *this* kind of driving, you aren't enjoying half of what your car offers you.

ETHYL NEWS

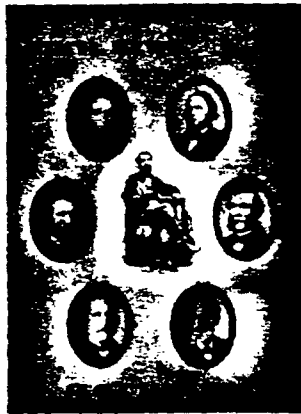


OLD CENTRAL STORE

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ETHYL NEWS

MAY - JUNE 1959



THE COVER pictures some of the oil industry pioneers who are featured in special articles in this oil centennial issue. Surrounding Edwin L. Drake (see pages 15-19), are (clockwise, from top left): Samuel M. Kier (pages 5-9); Benjamin Silliman, Jr. (pages 12-14); Samuel Van Syckel (pages 30-31); John A. Mather (pages 22-26); Anthony F. Lucas (pages 32-33) and Col. E. A. L. Roberts (pages 27-29).

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BORN IN FREEDOM
WORKING FOR PROGRESS

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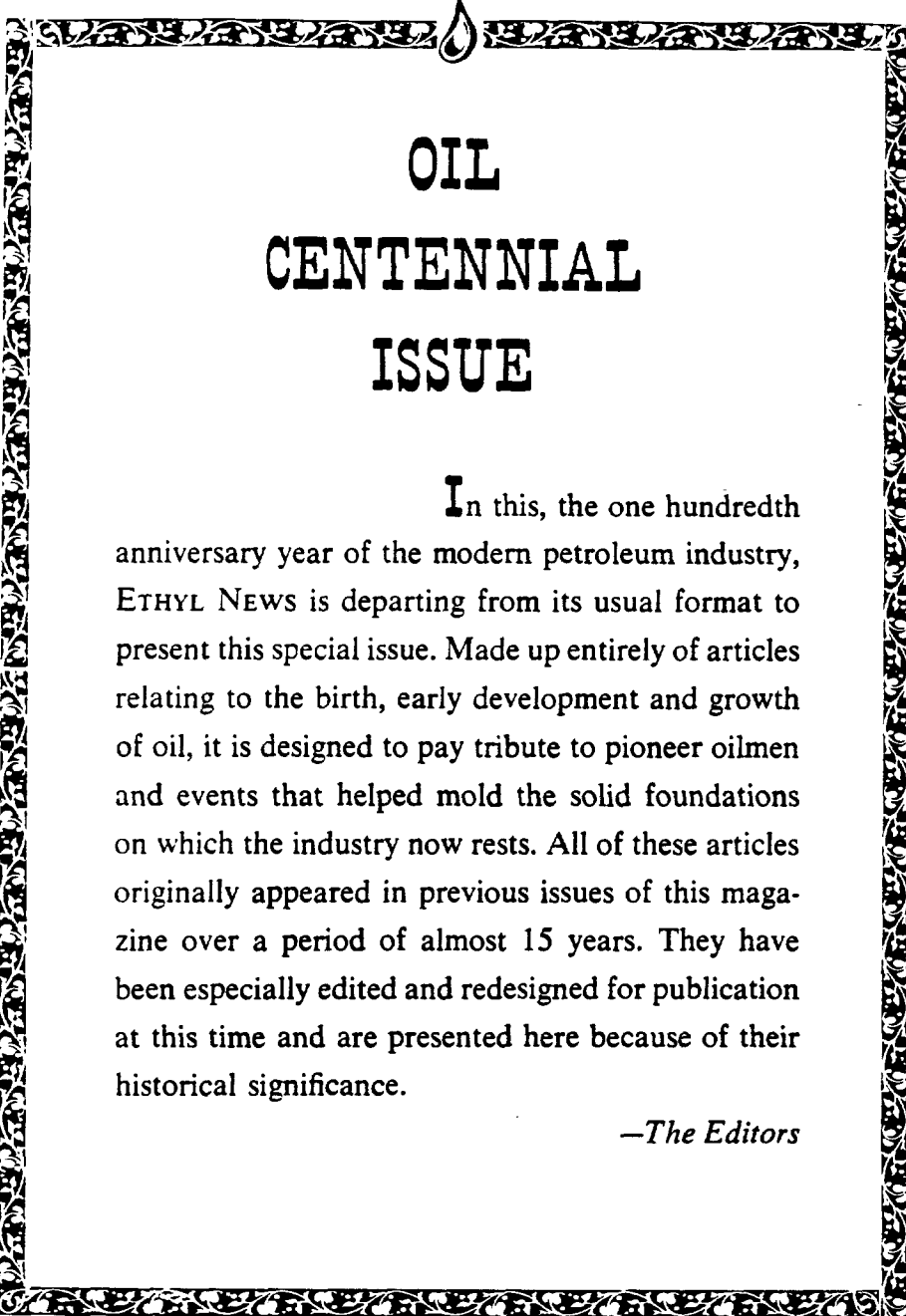
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OIL CENTENNIAL ISSUE

In this, the one hundredth anniversary year of the modern petroleum industry, ETHYL NEWS is departing from its usual format to present this special issue. Made up entirely of articles relating to the birth, early development and growth of oil, it is designed to pay tribute to pioneer oilmen and events that helped mold the solid foundations on which the industry now rests. All of these articles originally appeared in previous issues of this magazine over a period of almost 15 years. They have been especially edited and redesigned for publication at this time and are presented here because of their historical significance.

—The Editors

A GUIDEPOST TO OIL



The Evans map of 1755 noted the presence of petroleum at almost the same place where the Drake well came in over a century later

MORE THAN two hundred years ago there issued from Benjamin Franklin's printing shop in Philadelphia a document headed "A General Map of the Middle British Colonies in America."

Drawn by Lewis Evans, then as now an obscure man, the map turned out to be a work of political, military and social significance. One of its outstanding features was the appearance of the word *Petroleum* near the present site of Oil City, Pa. This, so far as is known, was the first notation on any document that oil existed at almost the very location where Colonel Drake brought in his epoch-making well in 1859.

Western Pennsylvania in the mid-1700's was little but primeval forests inhabited only by "wild Indians, bears and rattlesnakes." Few white men had visited the area. Just how then could a man — particularly one such as Lewis Evans, who had never traveled that part of the Colonies — pinpoint the locale of oil?

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The answer is found in an episode of history, little known even though it marked the entrance of George Washington upon the world's stage.

Flash back to a cold night in December 1753. Inside a log cabin at Venango (now Franklin), Pa., Washington and a motley group of men are huddled around the big fireplace. Mostly the men drink brandy and argue the future of America.

A few miles away, a black liquid bubbles to the surface from deep springs. Two of the men in the cabin are aware of the oil springs. A third is destined to learn about them and to tell Lewis Evans where to locate them on his map.

Washington, only 21, had braved the dangerous Pennsylvania wilderness to carry an ultimatum to the French army commanders from Governor Dinwiddie of Virginia. The message protested the encroachment on "the King of Great Britain's Territories" and demanded the "peaceable departure" of the French.

One of Washington's companions was Tanacharison, chief of the Senecas. Also in the young major's party was John Davison, a rough trader who served as Indian interpreter.

The French commander who received the group at Venango was Capt. Philippe Joincaire. He and Tanacharison were familiar with the nearby oil springs if none of the others was.



There is no proof that oil was a subject of small talk among the others in the wilderness cabin that December night. Well might it have been, however, since later events indicated that the trader Davison had learned the location of the springs while accompanying Washington on this very mission.

After delivering his warning message, Washington returned directly to Virginia. He gave Governor Dinwiddie so alarming a report of French intentions that Virginia immediately began raising troops. The long and bloody French and Indian War was about to get under way.

Davison made his way to Philadelphia. There he delivered a report of his own—to Lewis Evans.

Evans, who made his living as a surveyor and draftsman, was preparing a map of the trans-Appalachian country. The need for an accurate map of the region was great. It was essential not only to define the extent of French and English territorial claims, but also to settle controversies among the Colonies over boundary lines and to encourage settlement across the mountains.

Evans had undertaken a difficult task. No surveys existed of the wild country, but—largely through his good friend Benjamin Franklin—he gained access to many informative documents from official Colonial files. Helpful material also came from journals kept by travelers.

Most of his information, though, was gathered from trappers, scouts and traders like John Davison—men who actually had seen the west.



Fresh from his exciting adventures with Washington, Davison painted for Evans a vivid verbal picture of the country around the French forts to the north of what later became Pittsburgh. He told also about the oil springs. These Evans located on his map by writing *Petroleum* near what is now Oil City. This, to repeat, was the first known written mention of the presence of oil at what proved to be the industry's birthplace.

The now-historic map was published on June 23, 1755, as part of a geographical pamphlet written

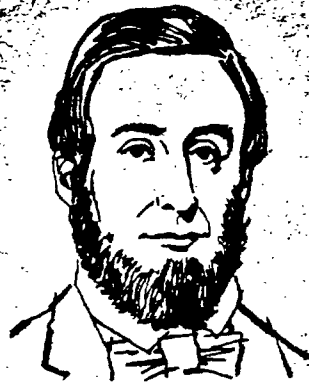
by Evans and printed by Benjamin Franklin. "A General Map of the Middle British Colonies in America" received an enthusiastic public reception. Throughout the French and Indian War, it was relied upon heavily by the British in their military campaigns. At war's end, it provided information for settlers pushing westward. It was used extensively as a guide in land transactions and in the consideration of inter-colonial boundary disputes.

Few original copies of the map remain. Of those still in existence, one is owned by Ethyl Corporation as part of its extensive collection of *Petroleum Americana*.

With his map, Lewis Evans made an extremely important contribution to the American Colonies. He helped to set the direction and unlock the limits of the country's westward expansion. Even without this, his name would have survived in the histories of the oil industry. For it was Evans who first brought to light, for all to know, that oil existed in the rolling hills of Pennsylvania. It was Fate that made man wait another century to claim that legacy. #



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HIS PITCH WAS OIL

Samuel M. Kier was America's first petroleum refiner and marketer and also the industry's first public relations spokesman

BACK IN THE 1840's a caravan of gilded and painted horse-drawn wagons fanned out from Pittsburgh to visit towns and villages throughout the eastern United States. While all of the wagons carried the same show, none of them journeyed together. Each had its own territory — New York, Pennsylvania, West Virginia, Ohio, Delaware. And each of the traveling showmen had his own way of making a spiel.

Stopping on a town's Main Street, the typical wagon would reveal a man sporting a mustache, fancy arm bands and suspenders, a diamond-studded horseshoe tiepin, and a brightly checkered suit.

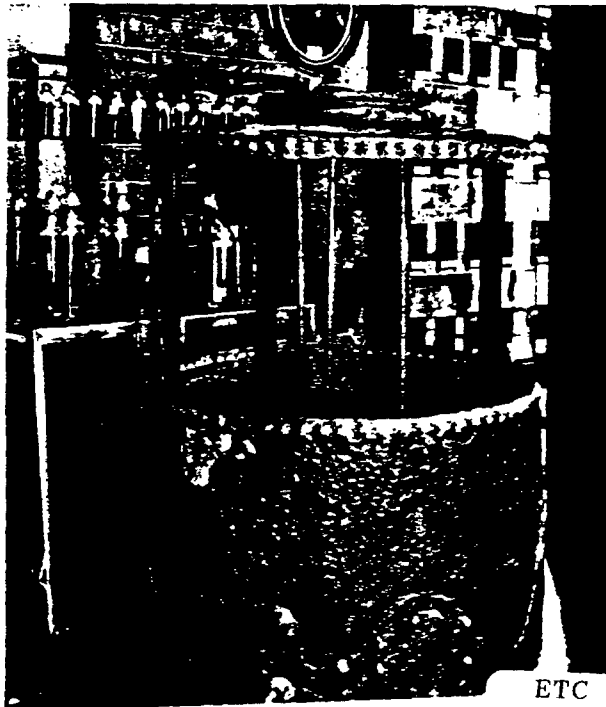
Dusting himself off after the trip, the man would set up his show, clamber aboard the back of his wagon, and with one of his button-shoed feet resting on the tailboard, go into his routine.

"My friends," he would tell the gathering townspeople, "I've come here today to tell you about a most wonderful remedy for mankind's ills—'Kier's Petroleum or Rock Oil.' Found deep in Nature's bosom, 400 feet below the surface, its discovery has opened up a new era in medicine . . ."

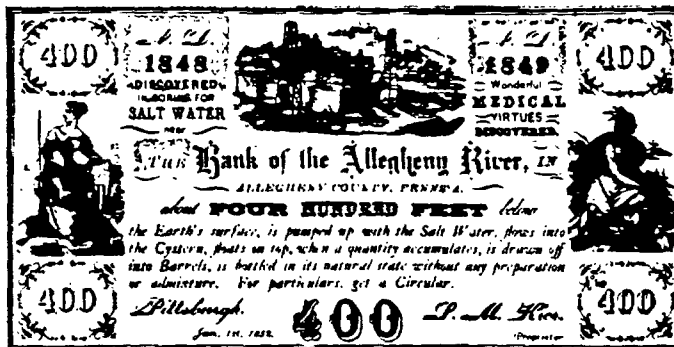
Here, he might pause for effect, and point to a

scene painted on the side of his wagon. That scene, taken from the Bible, showed the good Samaritan ministering to a wounded Hebrew. And as the audience's gaze dwelt on the painting, the barker would continue with his smooth-flowing line.

"Yes, friends, I've come to tell you all about this marvelous petroleum remedy. Through its instrumentality, the lame have been made to walk and the blind to see. Those who have suffered for



The five-barrel still in which Samuel Kier, America's first refiner, processed his crude.



Kier's "Genuine Petroleum" was sold in small, cork-stoppered bottles. The accompanying wrappers, handbills and posters

years from the torments of rheumatism, gout and neuralgia have been restored to health and vigor. It is efficacious against innumerable disorders and ailments, can be used as a liniment for aches, sprains and bruises, and is a marvelous cure-all for man and beast. Put up and bottled by Samuel M. Kier, of Pittsburgh—who discovered its wonderful curative properties—I am offering it to you here today at the ridiculously low price of fifty cents a bottle . . ."

Oil's First Spokesman

This sales talk, with variations, was used by the medicine show barkers traveling the different circuits. And while they were all carrying the message of "Kier's Petroleum or Rock Oil" to the hinterlands, back home in Pittsburgh, busily engaged, was the man responsible for it all. That man was Samuel M. Kier—who capitalized on the "medicinal" properties of petroleum . . . put it up in bottles . . . conceived the spiel for his traveling barkers . . . and even now was feverishly dreaming up new uses for petroleum.

Today, Kier is remembered as America's first oil refiner. Actually, he was far more than that.

At the very least, he was the first public relations

spokesman for oil—exciting men's curiosity about it, acquainting people with its inherent usefulness, opening up new marketing possibilities for it, stimulating the search for oil that was to follow.

Only in comparatively recent years have writers and historians come to pay full tribute to this human dynamo who started the oil industry rolling.

What manner of person was Kier? Says Harry Botsford in *The Valley of Oil*, "Samuel M. Kier . . . was a tall, robust man with twinkling eyes, a full brown beard and a brain that seethed with ideas. He was possessed of tremendous physical energy, a capacity to dream, plus the ability and the courage to make some of his dreams come true."

Kier's boundless energy and eager mind led him into all sorts of business enterprises.

Engaged in Many Enterprises

At one time, he was associated in a canalboat venture with James Buchanan, who later became the fifteenth President of the United States. Another of his business partners was Benjamin F. Jones, who subsequently became the first head of Jones & Laughlin Steel Corp. In addition to his career as an oilman, Kier was at various times engaged in

PETROLEUM, OR ROCK OIL.
A NATURAL REMEDY!
 PROCURED FROM A WELL IN ALLEGHENY COUNTY, PA.
 Four hundred feet below the Earth's Surface
 PUT UP AND SOLD BY
SAMUEL M. KIER,
 CANAL BASIN, SEVENTH STREET, PITTSBURGH, PA.

CALIFORNIA:—The first discovery of this valuable mineral was made in the month of August, 1846, in the State of California, by James W. Wicks, a pioneer settler, who, while engaged in the search for gold, discovered a well in the State of California, which yielded a quantity of a dark, greasy substance, which he called "Rock Oil." This substance was found to be identical with the "Rock Oil" discovered in the State of Pennsylvania, and was found to be a valuable mineral, which has since been found in various parts of the world.

PETROLEUM:—This mineral is a natural product of the earth, and is found in various parts of the world. It is a dark, greasy substance, which is used for various purposes, such as for fuel, for lubrication, and for medicinal purposes. It is a valuable mineral, and is found in various parts of the world.

THE PETROLEUM:—This mineral is a natural product of the earth, and is found in various parts of the world. It is a dark, greasy substance, which is used for various purposes, such as for fuel, for lubrication, and for medicinal purposes. It is a valuable mineral, and is found in various parts of the world.

oster... claimed its virtues in colorful language.

freight forwarding, coal mining, pottery making, and the cooperage trade, besides running a drug-store in Pittsburgh. He also started the Kier Fire Brick Co., with four small plants in western Pennsylvania, which later was merged with the General Refractories Co.

Kier, who was born in 1813, was in his early thirties—and a successful businessman at that—when he first was attracted to oil. It came about through his father, Thomas Kier, who operated several salt wells in the little town of Tarentum, outside of Pittsburgh.

Thomas Kier formed part of an important local industry which ferried salt to Pittsburgh by canal-boat. The industry was important because it could supply Pittsburgh with salt much more cheaply than the lumbering Conestoga wagons which had formerly brought it all the way from Philadelphia. The Tarentum salt merchants were prosperous. Their business was stable and assured, until suddenly their salt wells started running to oil.

The dark greasy stuff was an interminable nui-

Pittsburgh in the 1840's, when it was headquarters for Kier's marketing and refining operations.





James Buchanan (left), later President of the United States, and Benjamin F. Jones, a founder of Jones & Laughlin Steel, were among Kier's business partners.

sance. It came up with the salt water, contaminated the gathering tanks, gummed up the salt-distilling apparatus. Being lighter than water, the oil could be drawn off from the tanks and dumped into the canal. But then it would plague the local canalboat men, who complained that it coated their tow lines and dirtied the sides and decks of their boats. The floating oil, too was a serious fire hazard.

But the same petroleum that threatened to ruin his father's salt business suddenly gave young Samuel Kier an idea. From his knowledge of pharmacy he guessed that the oil might have some medicinal properties—just like salt, mineral water, and a lot of other things that came from the earth. Conversations with local medical authorities confirmed his hunch. Immediately, he proceeded to gather up the worthless oil, put it up in bottles, and sell it to the public far and wide. This was in 1846.

Believed in Curative Powers

While people today would regard his petroleum cure-all with an amused smile, Kier himself sincerely believed in its curative powers. Benjamin F. Jones, his business partner of earlier days, testified to Kier's faith in its medicinal qualities. Said he of Kier, "He was of a most generous spirit. Indeed, I have sometimes thought that he did not go into the business of selling oil as a medicine so much on genuine

speculative objects as he did from a philanthropic standpoint."

And on their own, hundreds of Pennsylvania residents swore by the remedy. In 1892, eighteen years after Kier's death, John W. Staley, a resident of Tarentum, recalled, "In those days everybody up here in Tarentum used the Kier oil for medicine, and I'll bet you will find plenty of persons still living who yet believe in the virtues of petroleum as a medicine. I am never without half a barrel of crude oil now in the house, and it is my standard remedy."

"Try Distilling the Oil"

Kier's petroleum was on the market only a few years when he began investigating other possible uses for the crude oil. One of these, he decided, was as an illuminant.

While the untreated oil burned freely, it had two persistent habits. It smoked and it stank.

Wondering what he might do about it, Kier took his problem to a Philadelphia chemist named J. C. Booth, who immediately hit upon the correct solution. "Try distilling the oil," he said.

Kier lost no time in acquiring an iron kettle, cover, and worm—and some free advice from a man who worked in a local whiskey distillery. Setting up a makeshift refinery on Pittsburgh's

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Seventh Avenue, Kier began distilling his crude—at first in a one-barrel still, later in a five-barrel affair.

Kier was anything but successful in his early experiments. His refined product was little better than the original crude, and gave off a terribly offensive odor when burned. Complaints from his neighbors, coupled with fears of an explosion or fire, prompted the Pittsburgh City Council to tell Kier to move outside of the city limits. So, loading his apparatus and equipment aboard several wagons, Kier moved out to Lawrenceville.

Developed Burner

Knowing nothing about the acid treatment of oils, which later followed, Kier was unable to remove the odor entirely from his distilled product. But he did improve it greatly by distilling each batch a second time. Meanwhile, he invented a four-pronged burner which admitted air to the flame and thus intensified the illumination from the fuel. Finally, then, he was able to market not only an improved household illuminant, but a burner to go along with it.

Kier's "carbon oil" was a godsend to pre-Civil War America. Its clear white light provided better

illumination, by far, than homes and offices had ever known before. People eagerly bought Kier's carbon oil—even at \$1.50 a gallon. According to Harry Botsford's chronicle, Kier's gross income from this one source alone was over \$40,000 a year. And Kier, in turn, provided a ready market for all the oil the nearby salt wells could produce.

Kier had built up an extensive business through his traveling salesmen, but it had one failing. While the petroleum itself originally cost him nothing, its selling costs ate up virtually all the profits. That is why he decided, in 1852, to withdraw his traveling salesmen from the road and to concentrate on selling the oil through drugstores. Instead of the smooth-talking barkers, Kier now relied on colorful posters, resembling the labels on his bottles, to advertise his product in drugstore windows.

Poster Suggested Drilling

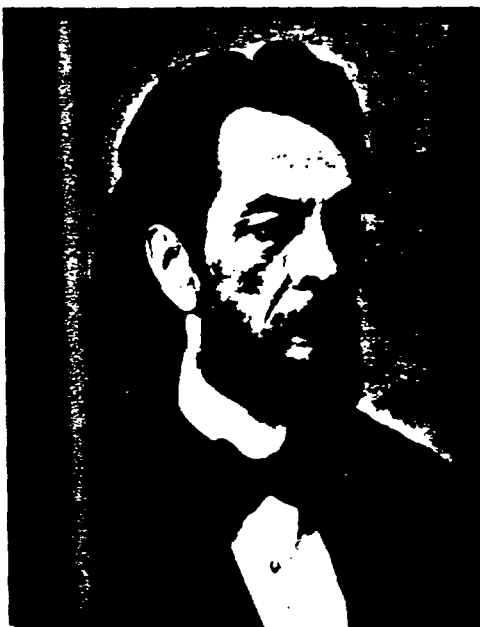
While it cannot be verified, legend has it that one of these posters was indirectly responsible for Drake's *drilling* for oil.

One day, George Bissell, who was to play a key role in Drake's discovery of oil, happened to pass by a Broadway drugstore while in New York City. He was struck by the picture of Kier's salt wells, which showed the derricks used in boring and pumping. If salt could be found by drilling, it suddenly dawned on him, why not petroleum? What followed thereafter is history.

While Kier did not participate in the drilling of the Drake well, he did come to know Colonel Drake, and to do business with him. In fact, the first shipment of oil by water from the Drake well was consigned to Samuel M. Kier, at Pittsburgh. More, he is credited with putting Drake in touch with other outlets for his oil. And, on his own, Kier at various times leased parcels of farm land which later became historic oil properties.

In the last hundred years, a variety of impressions have been made upon the public mind by each generation of oilmen. The discovery of new oil fields, the development of new products, the expansion of markets, all have brought the industry into closer contact with the public, have served to create parts of the kaleidoscopic impressions about oil that now exist in the public mind. Today, with the oil industry thinking more about public relations, it is interesting to recall that Samuel Kier was its first spokesman. #

George Bissell, who thought of drilling for oil after seeing a Kier "rock oil" poster.



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Oil research began at Dartmouth College in 1853—six years before the Drake well

search gives birth to entire new industries—petrochemistry, for example. Research is one of the reasons why the petroleum industry is ever growing and expanding; and why it can be expected to provide more and better products in the future.

Not only does research play a big part in the growth and progress of the oil industry, it was responsible for its very birth. If the oil industry traces its beginning to the famous Drake well, then oil research is older than the industry itself. The 100th anniversary of Colonel Drake's strike is being celebrated in 1959. The centennial of oil research was observed in 1953.

Late in June 1953, on the campus of Dartmouth College, in Hanover, N. H., oil industry leaders, businessmen, government officials and educators gathered to commemorate the world's first scientific examination of crude oil.

A memorial tablet placed on Dartmouth's Crosby Hall on that occasion tells the story of what took place there over a century ago.

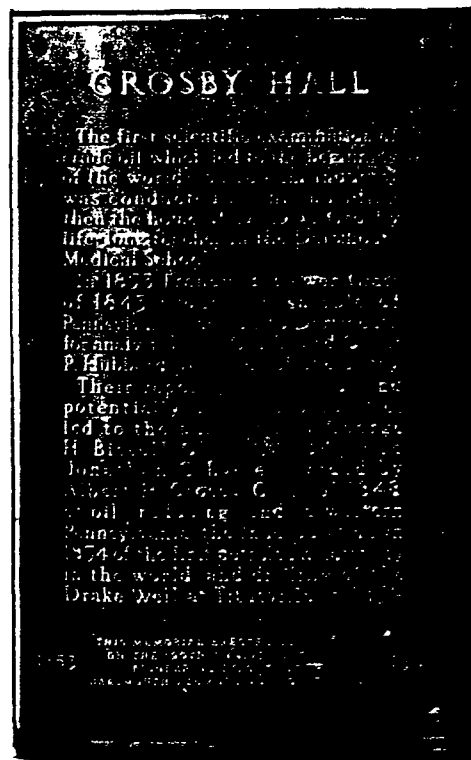
"The first scientific examination of crude oil which led to the beginning of the world's petroleum industry was conducted in this building, then the home of Dr. Dixie Crosby, life-long teacher in the Dartmouth Medical School," the plaque reads. "In 1853, Francis B. Brewer, Class of 1843, brought a sample of Pennsylvania rock oil to Dartmouth for analysis by Dr. Crosby and Oliver P. Hubbard, professor of chemistry. Their report of its useful and potentially valuable properties led to the purchase by George H. Bissell, Class of 1845, and Jonathan G. Eveleth, aided by Albert H. Crosby, Class of 1848, of oil-producing land in western Pennsylvania, the incorporation in 1854 of the first petroleum company in the world, and drilling of the Drake Well at Titusville in 1859."

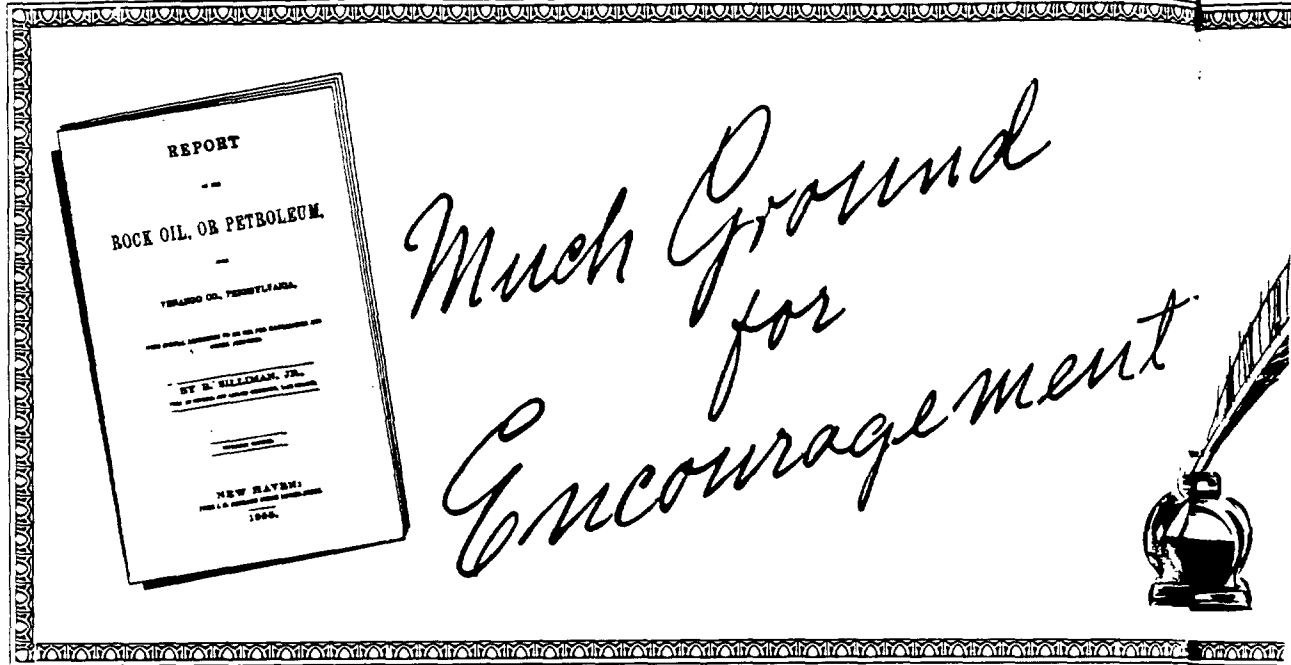
Tests Not Recorded

History does not record what tests Messrs. Crosby and Hubbard made or what equipment they used to study the strange, black liquid that had been brought to them. But it does state that they came to the conclusion that it was "produced at a great depth in the earth, by the decomposition of vegetable and bituminous matter."

The first oil scientists apparently were as inaccurate in their predictions of the future of oil as they were accurate in their early analysis of it. They reported that petroleum probably never would be found in sufficient quantities to make it valuable.

The Drake well, for which they were indirectly responsible, and the thousands of wells and fields that have come in since, have proved how wrong they were. And research, that branch of the industry they unknowingly fathered, has played a vital part in the development of oil. #





The now-famous Silliman report of 1855 gave men the confidence to drill for oil



Benjamin Silliman, Jr.

BENJAMIN SILLIMAN, JR., was one of those chosen few who left a lasting legacy to the world.

He was an outstanding scientist, educator and lecturer; the author of popular textbooks on chemistry and physics; editor of the *American Journal of Science*, the first successful scientific publication in the United States; and founder of what later became Yale University's renowned Sheffield Scientific School.

But even if he had accomplished none of these things, Benjamin Silliman, Jr., still would have won enduring fame because of a single act. That was his preparation, in the year 1855, of a searching analytical report on Pennsylvania crude oil. It was Silliman's report—so thorough, so enthusiastic and so prophetic—that gave men the courage and confidence to risk their money to try to unlock petroleum from its hiding place.

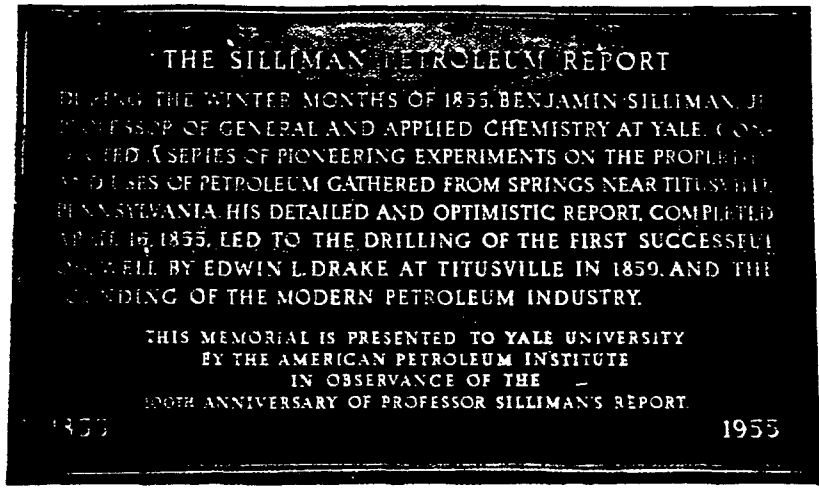
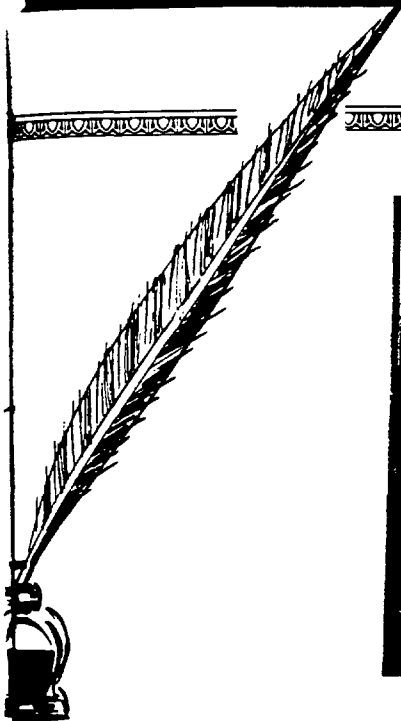
In his way then, "young Ben Silliman" had as much to do with the birth of the oil industry as any other man.

On the 100th anniversary of Silliman's chemical classic, the American Petroleum Institute presented to Yale a commemorative bronze plaque for

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mounting in the Sterling Chemistry Laboratory at the New Haven institution. The plaque credits the Silliman report with leading to "the drilling of the first successful oil well by Edwin L. Drake at Titusville in 1859, and the founding of the modern petroleum industry."

If anyone in this country more than a century ago was qualified to conduct an exacting scientific analysis of crude oil, it was Silliman. Thirty-eight years old at the time, he was the famous son of a famous father. Among countless other achievements, the elder Silliman had become Yale's first professor of chemistry and natural history when only 23 years of age.

Assisted Illustrious Father

Soon after graduation from Yale in 1837, young Silliman began to assist his illustrious father in the laboratory and before long he, too, became a professor of chemistry. In his early years on the Yale faculty he wrote a memorandum which resulted in formation of the school of applied chemistry, the forerunner of Sheffield Scientific School. He also became one of the school's first professors.

Silliman was persuaded to make the study of Pennsylvania petroleum by a young New York lawyer, George H. Bissell, and his business partner, Jonathan G. Eveleth, who held oil property near

Titusville. James M. Townsend, a leading New Haven banker, was enthused by Bissell's bubbling accounts of how petroleum could take the place of coal oil as an illuminant but requested a scientific analysis of the crude before investing any money. It was natural that Bissell and Eveleth should ask Silliman to undertake the assignment since no name was more respected in the entire field of chemistry.

To develop their property along Oil Creek, Bissell and Eveleth had organized the Pennsylvania Rock Oil Company of New York. But the stock was not selling. Times were bad and people were hesitant to invest in any new enterprise. The company organizers had only one glimmer of hope—the favorable report they expected to receive from Silliman.

In his historic report, Silliman wrote that the oil he examined possessed high value as an illuminant, had "important qualities" as a lubricant and could be used for still other purposes.

"In conclusion, gentlemen," he stated, "it appears to me that there is much ground for encouragement in the belief that your Company have in their possession a raw material from which, by simple and not expensive process, they may manufacture very valuable products. It is worthy of note that my experiments prove that nearly the whole of the raw product may be manufactured without

waste, and this solely by a well directed process which is in practice one of the most simple of all chemical processes."

But even with such a glowing report by one of their respected fellow-citizens, many New Haven men of means refused to invest. The hitch was that under New York State law the property of stockholders was liable for a company's debts. Would-be investors were not willing to run that risk on an untried venture. Bissell and Eveleth overcame this by reorganizing their firm as the Pennsylvania Rock Oil Company of Connecticut, since that state had no such law.



Above, the building in which Benjamin Silliman, Jr., analyzed Pennsylvania rock oil, and, below, the Yale campus in New Haven at about the time he issued his encouraging report.



With this change, many prominent New Havenites bought stock, and Silliman, who had been given 200 shares, became president of the company.

Just as they had risen, however, the fortunes of the Pennsylvania Rock Oil Company of Connecticut fell, and Townsend, the banker who originally requested the scientific study of crude oil that Silliman made, formed a new firm. This was the Seneca Oil Company, under whose auspices Colonel Drake actually drilled his discovery well.

Analysis Extremely Accurate

Neither time nor subsequent events have dulled the lustre of Silliman's study of Pennsylvania oil. His "Report on the Rock Oil, or Petroleum, from Venango Co., Pennsylvania" was a thorough scientific investigation of petroleum by an American scientist. Its detail and accuracy are all the more meaningful when it is remembered that Silliman's conclusions were reached at a time when man knew next-to-nothing about petroleum.

Silliman pointed out that crude oil contained several distinct products of different boiling points. He noted that the different oils, or products, could be separated by "fractional distillation." The very products that he had indicated could be derived from crude became the industry's chief products for decades. Silliman not only described these products and their uses, but told how they could be obtained.

His report, as oil historian Paul H. Giddens has termed it, was truly "a turning point in the establishment of the petroleum industry."#



The Man Nobody Knew

Fierce honesty and grim determination marked the character of Edwin L. Drake

THE BEGINNINGS OF THE OIL INDUSTRY, as everyone knows, were humble indeed. The founder of the industry drilled a well which produced all of 20 barrels of oil daily. Yet he started America's first oil boom and took the initial step in the tremendous march of oil progress which has moved continuously and rapidly the world over.

Somehow, in looking back, people seem to think that the Drake well was discovered by pure chance. Mindful of the gushers and oil booms and grizzled wildcatters of yesteryear, they seem to feel that Drake and his associates just picked a likely looking spot—and struck it rich.

Actually, the stubborn determination of Drake to carry on, against all odds, was as much responsible for bringing in that well as any other single factor. He risked his meagre personal fortune to drill that well, and begged and borrowed every cent he could to carry on. He also originated an idea in drilling, which was no small contribution in itself. In the end, Drake's company failed, even though he had shown the world how to find oil by drilling for it. But that is another story . . .

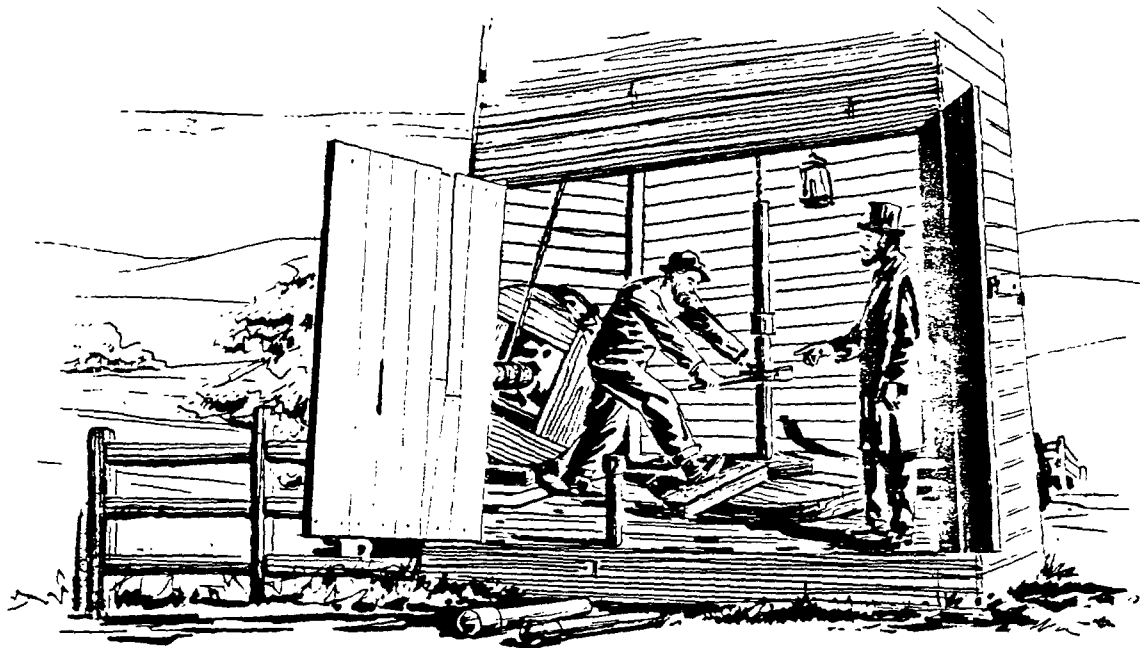
Strangely enough, Edwin L. Drake today stands as a somewhat vague and shadowy figure in the half-light of history—an individual who was an unwitting instrument of a capricious fate. His personality has been overshadowed by those who did more spectacular and picturesque things. The real Drake has never emerged in sharp focus.

There are many phases of oil field history that are in sharp dispute, even when weighed on the scales of existing documentary evidence. But the basic facts about Drake, as supplied by impartial witnesses and by Drake's own pen, are sure.

Had Checkered Career

He was the son of Lyman Drake, a New York farmer. He left the farm at 19, and became a night clerk on a steamboat that sailed between Buffalo and Detroit. He was a hotel clerk, a dry goods clerk, and then a conductor on the New York & New Haven Railroad for ten years before fate touched him lightly on the shoulder and led him into strange pastures.

He wasn't working at the time, but was recov-



ering from a malarial fever and living in the Tontine Hotel at New Haven, where he met James M. Townsend, a banker. Drake was tall, his beard was black, his hair carefully brushed. He walked with a slight stoop, and there were lines of suffering around his melancholy eyes. He dressed neatly and carefully; his speech was that of an educated man. His manner was quiet and he was not given to idle talk. His first wife was dead; he had remarried, and had a little girl.

Townsend was attracted to Drake, and had formed a high opinion of his latent ability. Over their cigars, the banker told Drake about the Seneca Oil Company of which he was an officer.



James M. Townsend, New Haven banker who hired Edwin L. Drake to drill the first oil well.

The Seneca Oil Company had taken over the assets of the Pennsylvania Rock Oil Company of New York, which had a tenuous title to some land near Titusville, the location of a spring that bubbled petroleum or "rock oil." The original company had suffered from indifferent management and a lack of working capital. Townsend's company proposed drilling an artesian well at the site of the spring in the hope of tapping the source of supply of the new and mysterious petroleum.

Invested Entire Savings

The banker was enthusiastic in a cold, persuasive manner. Before the men parted, Drake had invested his entire savings, a matter of \$200, in the venture.

Townsend's promise of dividends didn't materialize. Drake felt unhappy about it and said as much to the banker, who promptly countered with a proposal that Drake go to Titusville as the agent for the company, at an annual salary of \$1,200. Townsend knew that Drake could travel on a railroad pass; thus there would be no travel expense.

Drake was far from being well, but he accepted the offer with good cheer. It has been said that the idea of drilling for oil was Drake's, but there is no supporting evidence. At any rate, the stock certificates for the Seneca Oil Company pictured an artesian well derrick.

Drake was thoroughly briefed as to the nature of the reports he was to make; every cent expended

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was to be accounted for. Once Townsend paused in his instructions and smiled thinly. "Your mail will be addressed to 'Colonel' Edwin L. Drake," he said quietly. "That will impress the villagers and it will help your credit and that of the company—nothing like a military title to impress people!" It is not recorded how Drake felt about the title; he had no choice but to accept it. But he always frankly confided to his intimates that it was spurious.

The Drakes arrived at Titusville on May 15, 1858. He was tired and filled with assorted aches as he climbed wearily from the stage that had taken two days to come from Erie, 50 miles away.

He went about his job methodically. He was a stranger, and the villagers spotted him as a city man—which he was. That he proposed to drill a hole and produce a lot of "rock oil" was something they considered the footless endeavor of an alien stock company, a specious sort of mysterious swindle. But the merchants of the little village found him to be fiercely and ruggedly honest, a reputation that eventually was responsible for the successful completion of the project.

Patient Despite Difficulties

Progress was slow, but Drake was a patient man. There were dozens of times when a man with less fortitude would have given up. Drake, however, was made of sterner stuff. The village stores were poorly stocked. When he needed a pick, he had to go to Hydetown for it. The purchase of spikes meant a trip to Pleasantville. When he needed shovels, a 50-mile trip to Erie was involved.

He borrowed a horse from Ruel Fletcher, a merchant and one of his close friends, and rode to the

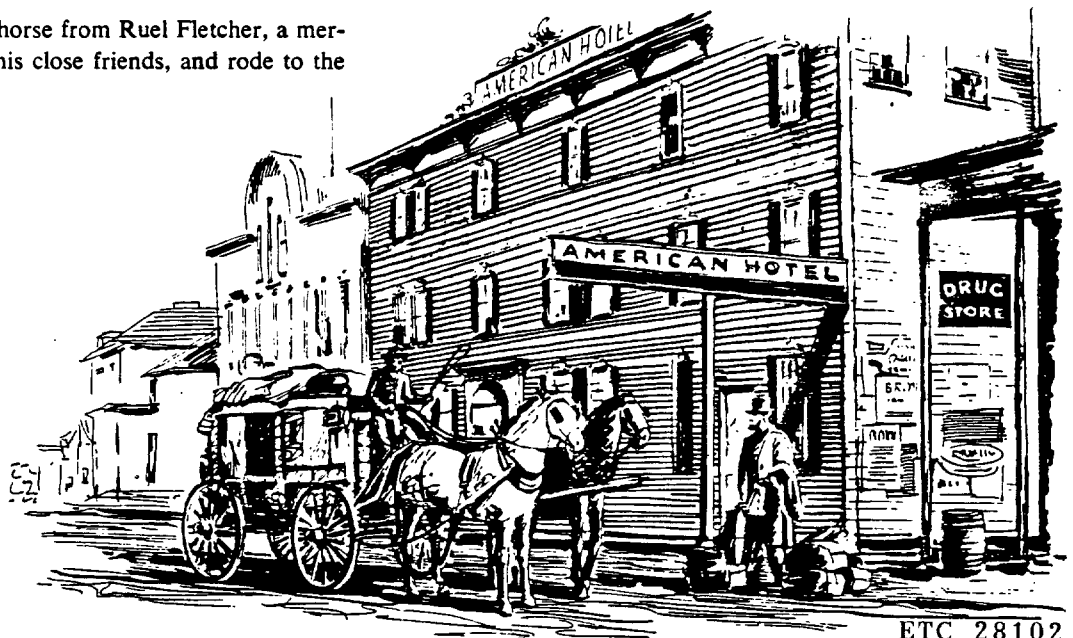
salt water wells of Tarentum, over 100 miles away, seeking a skilled driller of artesian wells, one who could supply the tools and who could complete a well 1,000 feet deep, if necessary.

He found such a man, and told him that he wanted to drill for oil. The man promised to come. Drake was tired and filled with pain when he returned. He went to bed for a day. But the man never appeared, and the trip was again made, another promise extracted from another driller—who also failed to appear. Resolutely, Drake returned to Tarentum, and met William Smith, a competent driller who kept his promise. Smith chuckled and told Drake the other men didn't come because they felt that Drake was crazy.

Originated Drive Pipe

There were many times during the course of drilling the well when Drake could have thrown up his hands and dropped the whole project. The drill encountered liquid mud and quicksand, and no progress could be made. It wasn't Billy Smith, the experienced driller, who solved the problem, but Drake, the city man. He originated the idea for drive pipe, the principle of driving lengths of heavy pipe through the quicksand to the bedrock, then bailing out the contents and making possible a resumption of drilling. He didn't take time out to patent the idea, but such a practical step might have meant great wealth to him. He was a stubborn man. He had one goal, and he wanted to devote his full but waning energy to attaining it.

From 1858 to the completion of the well, the





The other man in this now-familiar photograph of Edwin L. Drake and his discovery well was his friend and benefactor, Peter Wilson (left), the Titusville druggist.

total expenditures of The Seneca Oil Company, including Drake's salary, were only \$1,989.58. Drake meanwhile had stretched his personal credit to the limit. In midsummer of 1859, he talked soberly to Ruel Fletcher and Peter Wilson, his good friends. Since the first of the year, the company had sent him only \$500 for supplies and wages. His salary was unpaid. He was hundreds of dollars in debt to Fletcher for domestic supplies; he owed Wilson for drugs and medicine.

Borrowed Money

Somewhat timidly, he said that the well could be completed for another \$500. Would his friends endorse his note for that amount? He was grimly determined to finish the well and had complete confidence that the project would be a success. He had no security, aside from his personal faith and integrity. Finally the friends agreed, the money was raised, and Drake tossed it into the project, making the end result possible.

The promoters came running when the well became a sensational success. They didn't waste time

in praising their hired man. Largely, they ignored him. In March of the following year, they demanded Drake's resignation. Fletcher and Wilson had difficulty and delay in getting their money back. No one associated with the venture made money directly from it. The Seneca Oil Company was liquidated in 1864, and the property was eventually sold for non-payment of taxes, a matter of \$4.37.

Several of the promoters made fortunes in the oil business, leasing and drilling wells along Oil Creek. Careless historians have pointed out that Drake had the same opportunity but foolishly rejected it, having no idea of the potential richness of his discovery. This is an unkind and cruel appraisal of the man. It fails to take into consideration several things, including his inherent loyalty. When the big rush for territory occurred, he was still a salaried employee, on the job daily. He was sickly, and his physical strength was on the wane. Besides, he was deeply in debt. This was the combination of circumstances that left him high and dry while the full tide of fortune passed by.

Fletcher would find him propped in bed, his face deeply seamed with pain. He was penniless, he confessed shyly. Fletcher saw that Drake was elected as Justice of the Peace, and the fees amounted to about \$3,000 a year. He also acted as buying agent for a New York oil broker. He lived comfortably and paid his debts, but he was still plagued with the pangs of rheumatism. One day he announced that he was going to sell his home and move to New York, where he would be an executive with a firm of oil brokers. He had about \$12,000 in cash when he left. But Drake was gullible. The firm wanted only two things—his name and his cash. Shortly thereafter, the company failed and Drake was destitute again.

Pleaded for Help

In May of 1866, he sent a pitiful letter to Peter Wilson: "If you have any of the milk of human kindness in your bosom for me and my family," he pleaded, "send me some money. I am in want of it sadly and am sick."

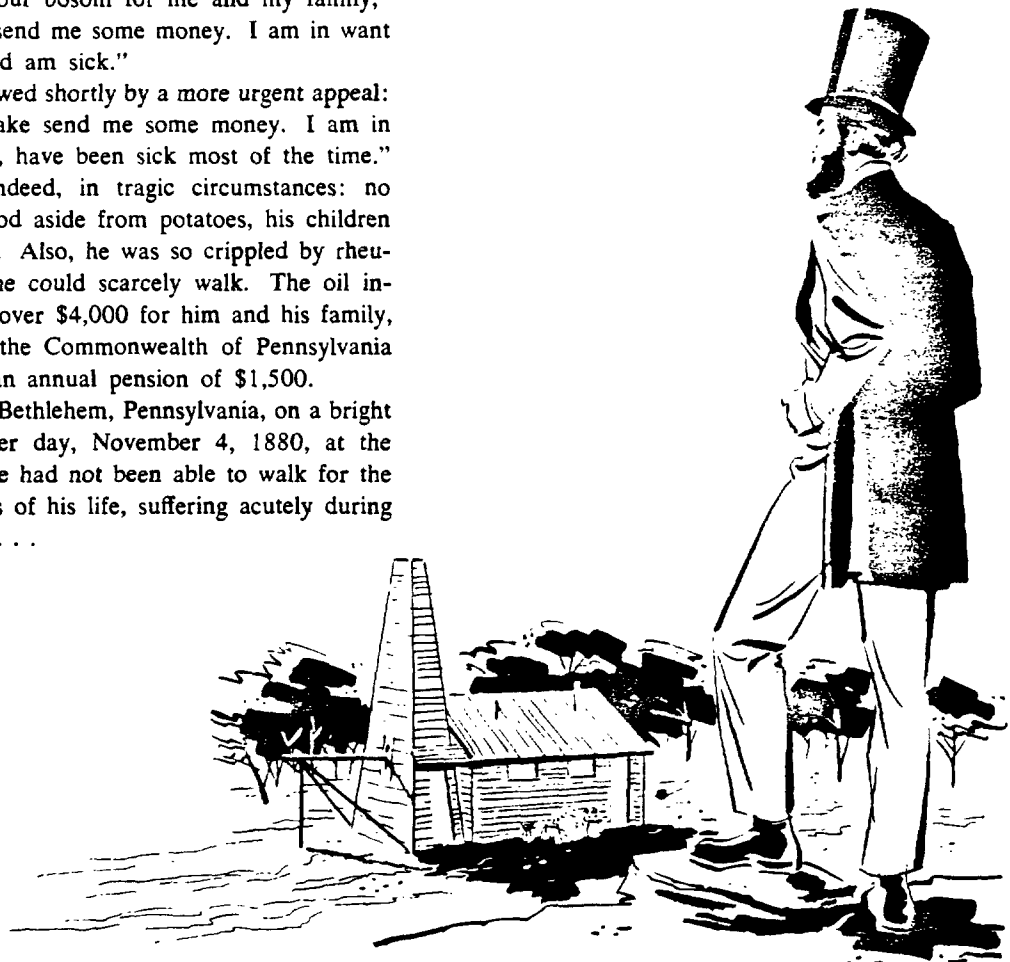
It was followed shortly by a more urgent appeal: "For God's sake send me some money. I am in want of same, have been sick most of the time."

He was, indeed, in tragic circumstances: no money, no food aside from potatoes, his children without shoes. Also, he was so crippled by rheumatism that he could scarcely walk. The oil industry raised over \$4,000 for him and his family, and in 1873 the Commonwealth of Pennsylvania granted him an annual pension of \$1,500.

He died at Bethlehem, Pennsylvania, on a bright Indian Summer day, November 4, 1880, at the age of 61. He had not been able to walk for the final ten years of his life, suffering acutely during that interval. . . .

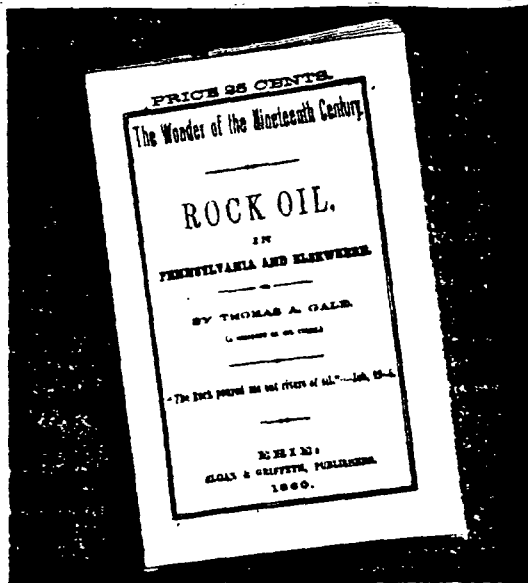
Perhaps there was no glamor in the life of Edwin L. Drake. He hit only one home run, but he did it with the bases filled. Whatever his shortcomings, his honesty and personal integrity have never been questioned. He accepted a big responsibility and discharged it competently in the face of difficulties that would have discouraged a man of a less-stout heart. In his life, he had courage; he was decent and gentle, honorable in all things. An examination of his correspondence, the letters and the records of his associates and friends, fails to reveal that he was bitter about his ill fortune.

As the pioneer oil man, he was neither a demigod nor a fool. He established a pattern of tenacity for the industry he launched, a tradition of integrity, a record which the industry can proudly and sincerely acclaim. #



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The answers to many basic questions about the infant oil industry are found in author Thomas Gale's "Rock Oil" . . .

Petroleum's First Book

NOT by the widest stretch of his imagination could Thomas Gale have thought, when he put down his pen on June 1, 1860, that he had written a book destined to become one of the rarest of all oil publications.

Entitled "The Wonder of the Nineteenth Century: Rock Oil in Pennsylvania and Elsewhere," it was finished less than 10 months after the Drake well was drilled near Titusville. All available evidence indicates that it was the first book ever written about petroleum.

Only three copies of it are known to exist. One is in the Henry E. Huntington Library and Art Gallery at San Marino, Calif., another at the Co-

lumbia University Library in New York City, and a third is in the possession of Ethyl Corporation in New York.

Gale wrote his book to satisfy a public desire for more information about petroleum. Newspapers had carried belated accounts of Drake's discovery well and of the mad scramble for oil that followed. But the world knew little about petroleum itself.

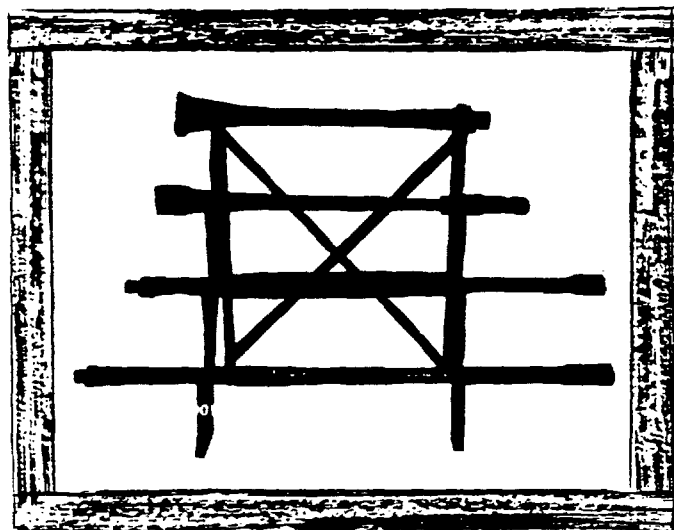
Questions Answered

Apparently great quantities had been trapped hundreds of feet underground in northwestern Pennsylvania. But how did the oil get there? How difficult and costly was it to secure? Was there enough to supply light and lubricants for everyone?

Gale undertook to answer these and other basic questions about the highly mysterious substance. He covered such topics as the origin of oil, how to find it, uses for the heavy black liquid, costs and profits, and prospects for the new industry's future.

His first chapter, logically enough, defines and describes crude oil as a heavy liquid with "a color of dark bluish green. It is greasy to the touch and sure to reveal its presence by giving forth a pungent smell, with which it is loath to part."

Primitive tools used in drilling the first wells are among the subjects discussed in the valuable volume.





The forest of wooden derricks that sprouted in the hills of northwestern Pennsylvania was described in "Rock Oil" as imparting "to the place an air of life and energy."

In another chapter on drilling and pumping, the forest of wooden derricks sprouting in the hills of northwestern Pennsylvania is described as imparting "to the place an air of life and energy, especially at times when many men are hurrying to and fro among them."

Thomas Gale performed a remarkable job when it is considered that only a handful of wells had been completed at the time he was writing. He seemed to sense that, in the birth of the new industry, he was witnessing something of momentous importance to mankind. Accordingly, he handled his subject lovingly, with great care and accuracy.

Overlooked by Bibliographers

Because of its rarity, "Rock Oil" was overlooked by oil industry bibliographers until a fairly recent date. No mention of it appears in the Benjamin S. Lyman bibliography, finished in 1878 (probably the first oil bibliography), the Paul Schweitzer bibliography, finished a year later, or the famed Peckham government report of 1884, entitled "Production, Technology and Uses of Petroleum and Its Products."

So far as is known, it was not until 1937 that a Texas oil attorney, Robert E. Hardwicke, finally took notice of it in his "Petroleum and Natural Gas Bibliography." Dr. Paul H. Giddens, formerly cura-

tor of the Drake Museum, also mentions it in "The Beginnings of the Petroleum Industry." Dr. Giddens refers to it as "probably the first printed account of any size upon the oil developments from August 1859 until June 1860."

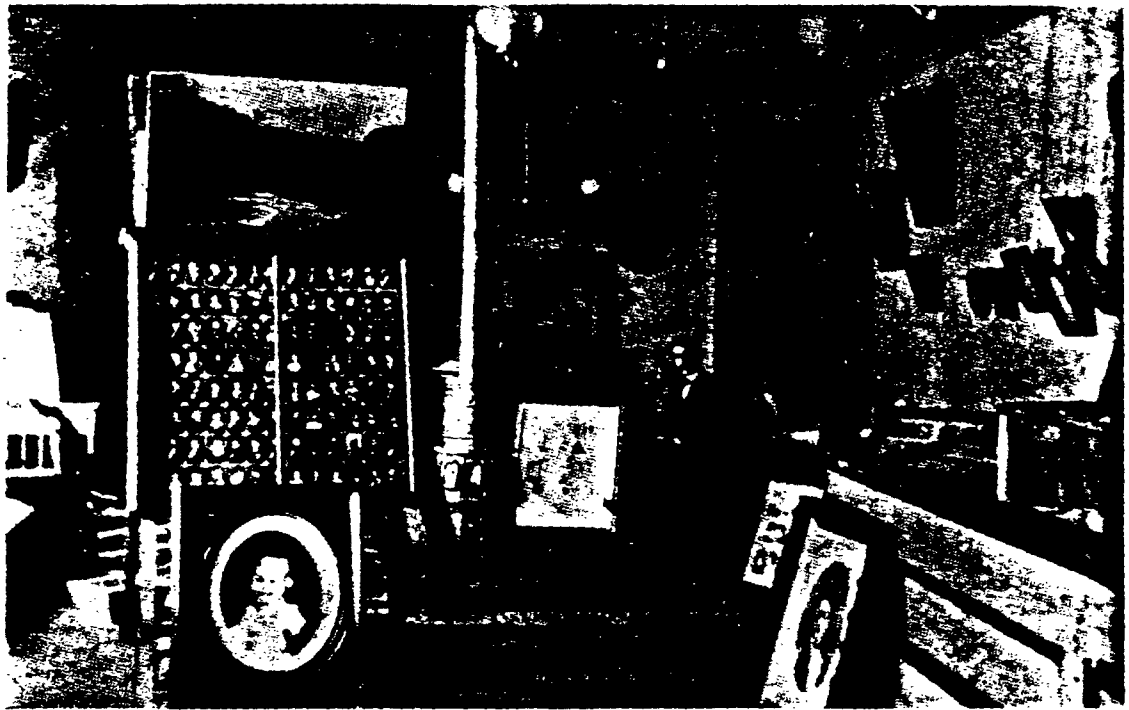
Printed in Erie

The 80-page "Rock Oil" was published by Sloan & Griffeth, of Erie, Pa., and was printed in the "steam printing rooms" of the *Erie Observer*. The poor wearing quality of the paper used for the book helps explain why more copies are not in existence. When first issued, it appeared on cheap newsprint and sold for 25 cents a copy.

As for Thomas Gale, no trace of him can be found. Perhaps he left Pennsylvania after writing the book and followed the changing tide of oil fortunes to other areas; perhaps he wrote under a nom de plume. The cover of the book describes him simply as "A Resident on Oil Creek," but gives no further clue as to his identity. A comprehensive search into historical records of northwestern Pennsylvania fails to reveal one iota of information about him.

In any case, it is certain he never knew how interesting his book would be today, nor how grateful the industry is for his painstaking and revealing accounts of the first months of the oil business. #

OILDOM'S FIRST C



**John A. Mather's pictures provide
an invaluable photographic record
of the industry's early years**

HISTORY OWES a great debt of gratitude to a man named Mathew B. Brady. Were it not for this Civil War photographer, and the crude cameras and developing equipment he trundled around the battlefields in horse-drawn wagons, there would be no pictorial record of the terrible War between the States.

In like manner, the petroleum industry is indebted to a photographer named John A. Mather, who was a contemporary of Brady. Thanks to Mather, there are preserved on glass plate negatives many of the vivid scenes accompanying the birth of the petroleum industry in America.

Throughout his career (he died in 1915 at the age of 88), Mather roamed up and down north-western Pennsylvania, everywhere taking pictures. Most of these pictures were made by the then rev-

CAMERAMAN

olutionary wet-plate method, which required immediate development of the negative but permitted any number of prints to be made. In the course of his work, Mather took pictures of pioneer oil men and their families; of famous oil wells, fields and farms; of the pioneer pipelines of his day, and of the band of teamsters who battled their coming; and of a host of other people and places that made Pennsylvania famous for oil.

The well-known picture of the Drake well was taken by Mather—but it is not of the original Drake well. The reason is that the well's original derrick and engine house burned down shortly after Drake struck oil. The structure, however, was immediately rebuilt and Mather was the first to take its picture. Mather also photographed Colonel E. L. Drake, after whom the well is named, and "Uncle Billy" Smith, originally a salt well driller, who in drilling the Drake well became the first oil driller in history.

Except for losing out on the original Drake well, Mather caught in his camera sight many of the wells which were to become milestones in the panoramic history of oil.

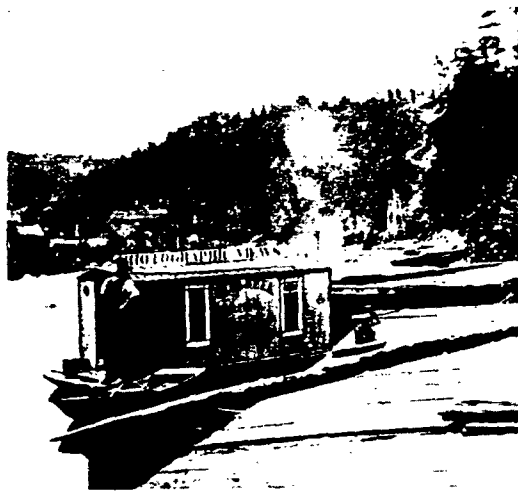


John A. Mather

He photographed the first great flowing wells along Oil Creek—the Empire, the Sherman, the Phillips, the Woodford, the Noble and Delameter.

Mather photographed the famous United States well, developed in 1865, which inside of a few months created Pithole City, one of the greatest oil boom towns of all time.

In 1863, Mather photographed the famous Reed well on the Smith farm along Cherry Run, the first to be "torpedoed" in a vain attempt to increase output. Five years later, he photographed the famous Harmonial well at Pleasantville, which started



Mather's Titusville studio and the houseboat on which the photographer traveled up and down Oil Creek.

the oil rush to Pleasantville and is one of the first instances on record of an oil field being opened up by spiritualistic means. Moreover, Mather photographed the famous "646" mystery well in the Cherry Grove district in 1882. This well marked the beginnings of the oil scouts; it also marked the beginning of frenzied speculation in oil.

In short, Mather followed the Pennsylvania oil fever wherever it erupted, slowly trudging along in his overland wagon or poling his flat-bottomed houseboat along the reaches of Oil Creek. He photographed, in their heyday, such famous oil towns as Titusville, Pleasantville, Oil City, Red Hot, Pioneer, Petroleum Center, Pithole City, Bradford and Shamburg.

Among the pioneers who posed for his camera was W. H. Abbott, who with James Parker and William Barnsdall, built the first refinery in the oil region. Another was John D. Archbold, later president of Standard Oil Co. (N. J.), while a third was J. J. Carter, founder of The Carter Oil Co., which is today Jersey's oldest producing subsidiary. A fourth was Cyrus D. Angell, well-known oil producer and originator of the oil belt theory whose "hunch" led to the discovery of oil in West Virginia and southeastern Ohio.

Mather photographed countless other figures, big and little, during the half century he worked at his calling.

Born at Heapbridge, England, in 1827, Mather was one of a family of six sons and a daughter. His father was superintendent of Ridgely & Sons' paper mill, one of the largest plants in England.

Visited Brothers

When his father subsequently purchased a paper mill at Alton Towers, Staffordshire, Mather thoroughly familiarized himself with the business, expecting to make it his life work. It happened, however, that his two oldest brothers, Edmund and Robert, had emigrated to the United States, and Mather decided in 1856 to visit them.

It was while he was with Edmund, who was running a summer hotel in Pennsylvania at a place called Sterrett Gap, that an incident occurred which was to change the whole course of Mather's life.

One day an Englishman named Johnson, driving a photographic van, stopped at Edmund's hotel. Talking with Johnson, Mather learned that the latter was the owner of six vans and that his business

was travelling around the countryside taking pictures. Mather became intensely interested and asked him if he might go along and learn the business. Johnson accepted and agreed to pay him \$5 a week and expenses.

Leaving Sterrett Gap the next day, the pair visited many towns in the hills of West Virginia while Mather learned the art of making and finishing pictures. Using the newfangled wet-plate process, this was a very laborious job, requiring considerable skill in preparing and developing. But Mather learned easily and quickly, and soon became proficient at it. Shortly thereafter, Mather decided to strike out on his own, and, severing his connection with Johnson, he bought an outfit and began travelling through West Virginia and Maryland, and then to Ohio.

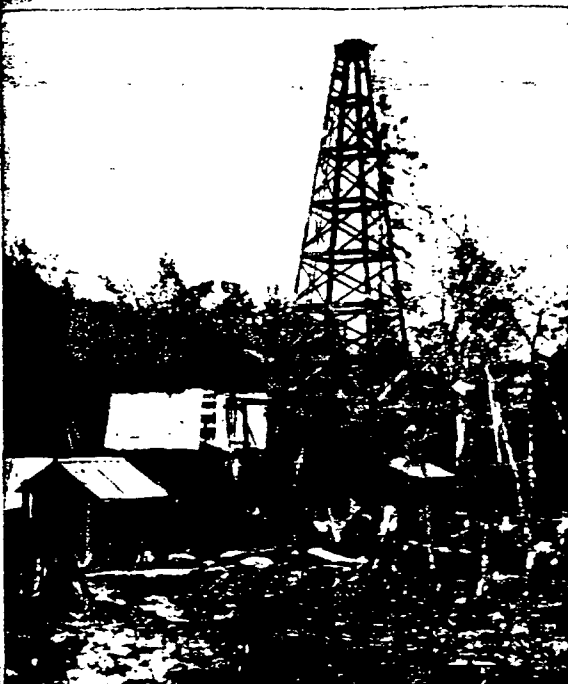
One day, while taking pictures in Painesville, Ohio, Mather heard the news about Colonel Drake's famous well near Titusville, and about the mad rush to Oil Creek it had precipitated. Since his business in Painesville was dull, Mather packed his equipment and started on October 4, 1860, for Union City, the nearest railroad point to the oil region. The same night he completed his journey by stage, arriving in Titusville about ten.

A Place to Make Money

A week's stay convinced Mather that here was a place where he could make some money. He rented for \$23 a month one half of a little building called a "portable car" at the southeast corner of Spring and Washington Streets. He put in a skylight, unpacked his equipment and opened for business. Outside the building he hung a small frame in which he displayed fifteen small tintypes and daguerreotypes as an indication of his skill as a photographer.

The 33-year-old Mather didn't realize it then, but he was to spend the next 55 years, the rest of his life, in the little city of Titusville, chronicling the growth and development of the oil industry in Pennsylvania. In his modest studio on Spring and Washington Streets (the first of four locations), he took pictures of everyone from pioneer oil prospectors and townspeople to babies in their christening dresses and Ma and Pa in their Sunday best. And as news was received of each new oil field discovery, he would hitch up his horse and wagon and lumber off to photograph the scene. Oil wells, railroad stations, teamster wagons, refineries, pipelines—all

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The "646" Mystery Well



The Reed Well



The Harmonial Well

*Photos
by
Mather*

formed a wonderful panorama for his camera sight.

For a man as captivated by the lure of oil as Mather, one would have expected him to take a fling at many a wildcatting venture. Actually, he had at least one fleeting chance to reap a fortune, but missed out because of a baby.

The golden opportunity came when a hard-pressed driller offered him a one-eighth interest in a well for \$68, the price of a horse needed to power a rig. Mather had the money and the inclination to buy the interest, but just at that moment he was photographing a baby. Thinking the driller would wait, he went ahead with his work. But the man went out and made the same deal with someone else.

Three days later the well came in with a rush and the one-eighth interest was worth \$175,000. Meanwhile Mather received \$1 for the picture of the baby.

What he lacked in financial reward, Mather made up in excitement. Once, in the midst of a protracted court fight, he was offered \$500 for one of his pictures. When he refused, another photographer was brought to Titusville to go into competition with him.

At first Mather was at a loss as to what to do, but one day he offered to take his competitor's picture by a new method. When the man agreed and seated himself in a studio chair, Mather whipped out his flashlight pistol, pointed it at his



More photographs by Mather. Though the tireless photographer usually was hired to take pictures of new fields and installations, he often snapped a scene for his own satisfaction.

rival's head, and gave him a lecture in "pure oil country code."

When the poor man seemed at the point of collapse, Mather raised his pistol and pulled the trigger. There was a blinding flash—and a scream—and the frightened victim fled from the studio, never to bother Mather again.

Mather took one brief flyer in oil, during the oil rush to Pithole City, in 1865, but it was unsuccessful. Returning to his regular business, Mather remained a photographer the rest of his life, content to photograph the lusty adventure of the oil fields. In the early seventies, he married Miss Mattie Tarr of Cherrytree township; they had one child, a daughter, later Mrs. Willard H. Hunt, of Philadelphia.

Mather never made much money from his photographic studio; it provided him with barely enough to keep him going from month to month. Yet he had a full life, a rich life, a life spent in the romance of oil. Mather died on August 23, 1915, in his 88th year, and was buried in a rural cemetery between Cherrytree and Dempseytown, Pa.

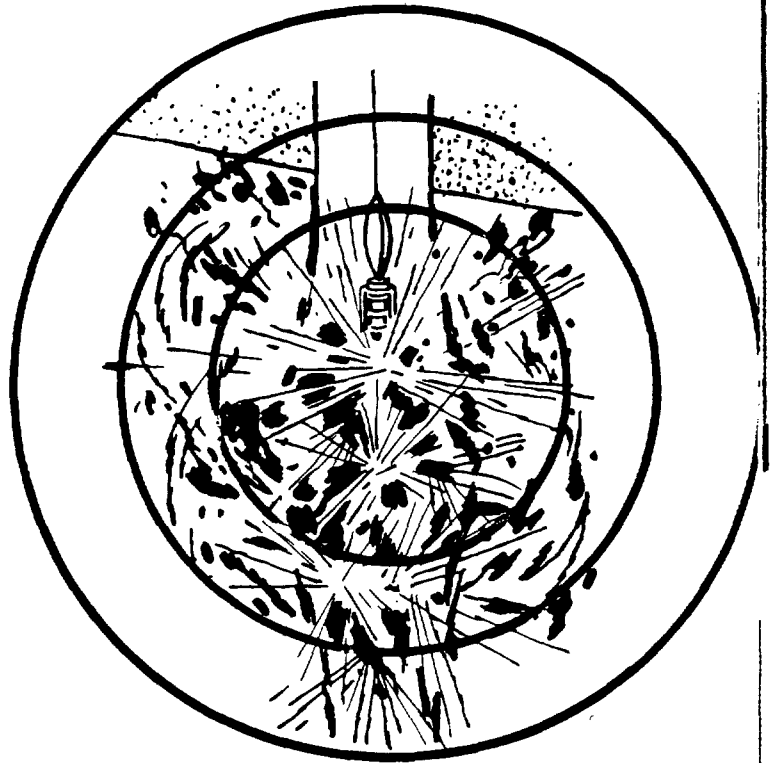
Tributes to Work

To his work, there have been many tributes. Said a writer in 1913, "John A. Mather has made it possible for the historians of the day to embellish American history with true scenes of the commencement of the world's now greatest industry." His pictures, wrote the editor of the *Titusville Herald* in 1896, "are the most delightful souvenirs of the primitive and halcyon days in the petroleum industry, which are gone never to return."

It is impossible to tell how many pictures Mather made in his lifetime. During the fire and flood at Titusville in June, 1892, he lost over 16,000 negatives, but nearly 3,000 others relating to the oil region were saved. As he grew older and less active in business, he wanted to dispose of the negatives so that they might have a permanent home after his death. In 1912 he tried to sell them to the State Museum at Harrisburg. An official representative was sent to Titusville to examine his collection but, "owing to insufficient funds," the State Museum could not purchase the collection.

After Mather's death in 1915, the Drake Memorial Association purchased the negatives for \$100. When Drake Well Memorial Park near Titusville was established in 1934, the entire collection was placed in the Drake Museum. #

HIS TARGET WAS OIL



Col. E. A. L. Roberts revived a dying oil industry with his powerful torpedo

IN JANUARY OF 1865, the oil industry was six years of age. It seemed about to die in its infancy. Oil men were able to diagnose the ailment, but were unable to find a cure.

Wells that started off with substantial initial production soon ceased to be profitable. Something inevitably choked off the flow of oil into the drilled hole. Curious schemes were tried in an effort to find a cure, but not one of them proved satisfactory.

There was no question about it in the minds of oil men: Unless a cure could be found, the oil industry was going to die.

One of the hard-hit producers was a Captain Mills of Titusville. He owned the famous "Ladies' Well," whose production had virtually reached the vanishing point. Thus, when a tall, austere man, possessed of an air of confidence, approached Captain Mills early in January 1865, and told him that

he could revive ailing oil wells, he found the crotchety old producer in a most receptive mood.

The caller introduced himself as Col. E. A. L. Roberts, late of the Union Army, a resident of New York City. Roberts claimed that he had just secured a patent on a process that would bolster oil output

When Mills inquired how the process worked, Roberts explained that he used an explosive. Mills snorted, and then told Roberts that the industry already had tried explosives without success. Roberts smiled thinly, renewing his claim that his method would work. "I use superincumbent tamping," he explained tersely. He said he had gotten the idea from seeing a shell explode in a millrace in Fredericksburg, Va., in 1862.

Roberts convinced Mills of his sincerity. Mills, in turn, offered the old and non-profitable "Ladies' Well" as a proving ground for an experiment that

was destined to shake the oil industry of that era to its wobbly economic foundations.

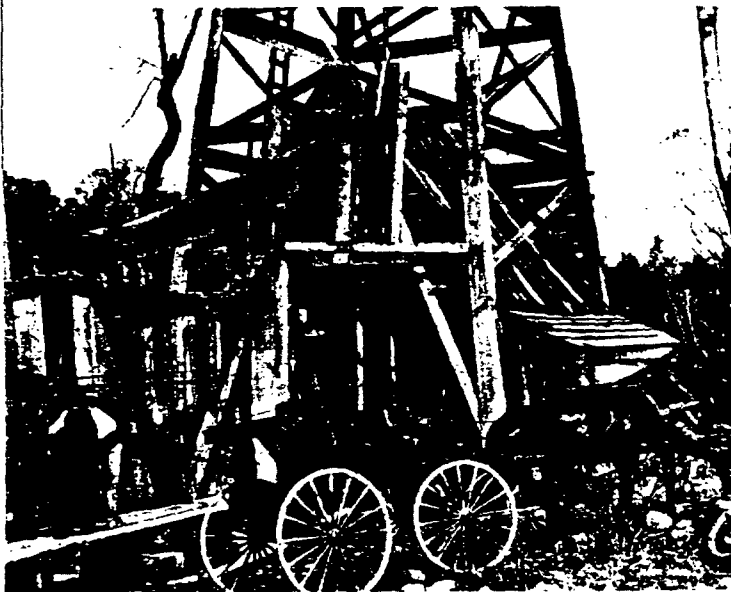
On a cold, blustery day, early in 1865, a group of oil producers gathered to watch the experiment. Roberts was calm and confident. He placed several jugs of gunpowder in a cast iron container, screwed a top on it and lowered it to the bottom of the drilled hole. Several barrels of water were poured down the casing. "This is the superincumbent tamping," he said quietly. "It's the most important phase of my process!"

Directed Explosion Downward

"The purpose of the tamping," Colonel Roberts continued, "is to keep the force of the explosion from coming up the casing, as if the casing was a gun barrel. Tamping directs the first force of the explosion downward and sideward. It creates a pocket for the oil, at the same time shattering the oil sands, letting the oil flow freely into the pocket. It also generates heat enough to melt the clogging paraffine that has kept the well from producing."

The Colonel tinkered with a small, heavy iron cylinder, filled with gunpowder, and fitted with a percussion cap at the lower end. Then he leaned over the casing head, dropped the device (soon to be known as a "go-devil"), and the group rushed to

An explosives wagon at an early well. Roberts' method of torpedoing soon became standard practice.



places of safety. The onlookers waited for what seemed a long time.

They heard a small report, unimpressive, muffled, and no louder than a cap pistol. Next there came a gusty sigh from the casing head, followed by a great roar as a solid stream of oil, water, and sand shot upward beyond the crown block on top of the wooden derrick. The wind caught the column as it diminished and the spray spread a fantastic yellow pattern on the white snow.

The men forgot the penetrating wind that swept down the valley as they rushed to the derrick. Hot, gassy fumes belched from the casing head and the smell of fresh oil was heavy in the air. The bailer was run down the hole slowly. The small engine sputtered steam as the filled bailer was brought to the surface. Its contents consisted mostly of fresh oil. Captain Mills swore happily.

Torpedo Company Formed

Before the group left, the bailer had been run and emptied many times. The ailing "Ladies' Well" again was a producer, thanks to the medicine of Colonel Roberts. Congratulated and hailed as "the savior of the oil industry," he accepted these attentions coldly. He informed the men, as he climbed into his sleigh, that he soon would establish an office to serve their needs.

It wasn't long before the Roberts Torpedo Co. became a reality. The Colonel offered the industry a "shooting" service for its ailing wells, with competent men in charge of operations. But when the company posted its schedule of fees, some oil men protested. The prices seemed excessive, especially to producers already suffering financial distress. The idea of using explosives was not new, they contended. This method had been unsuccessful in its earlier tests because the other pioneers had failed to use the superincumbent tamping.

Viewed objectively, what followed was inevitable. There ensued a curious revolt, culminating in bitter and expensive court battles, and in outright and illegal attack against Colonel Roberts. Meanwhile, he began using nitroglycerine in his method. With this then-new explosive, the process of "shooting" achieved new miracles in reviving old wells and in making new ones more productive.

The patent was attacked in the courts by a group of oil men. The validity of the patent rested on the word "superincumbent." Without exception, the

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courts' decisions were in favor of Colonel Roberts.

Many oil men in this group, realizing there was no other legal option, made their peace with Roberts and used his process—at his price. However, another group of men elected to fight it out to the finish. In the knowledge that nitroglycerine is easily compounded, this segment decided to beat Roberts at his own game. As a result, the industry soon witnessed a strange, fantastic contest.

The "Moonlighters' War" was of short duration, but it was memorable and exciting. Daring men mixed batches of "nitro" in washtubs at secret meeting places. On the next moonlit night they would fill jugs with the explosive, strap the jugs to their bodies, and walk cautiously over rough, dangerous trails to where they were to "shoot" some oil well in violation of the Roberts patent.

Not all of the "moonlighters" reached their destination. One unwary step, a stumble, a sudden jar—and the night would be lighted with a sudden red glare and the countryside rocked by a terrific explosion. Handling unscientifically compounded nitroglycerine made being a "moonlighter" a mighty hazardous calling.

Violators Prosecuted

As Roberts began to feel the economic pinch imposed by the expanding activities of the nocturnal adventurers, he hired private detectives to watch for violations. When evidence was accumulated, violators were haled into court. The insurgent members of the industry spent upward of a million dollars fighting these cases, and in other attacks on the Roberts patent. It was money thrown away. Roberts collected damages in every instance. More than 2,000 cases were in the courts at one time on this single issue, a record that has yet to be approached in Pennsylvania's legal history.

The insurgents unsuccessfully fought against the renewal of the patent. When they lost this case, they finally acknowledged defeat. The "Moonlighters' War" was over. Naturally, Roberts profited. But so did the oil industry. With slight variations, the same methods of well "shooting" are used today in every known oil field.

The Roberts family has presented to the Drake Museum in Titusville, the complete archives of the Roberts Torpedo Co. There is a great mass and variety of it. It throws interesting light on one of the most dramatic chapters of oil field history. #



The enterprising Colonel built his Roberts Torpedo Company factory on Hammond Run, near Titusville, Pa.



A contemporary sketch showing the Ar buckle Homestead well, near Pittsburgh, just after it was torpedoed.

PIONEER PIPELINE

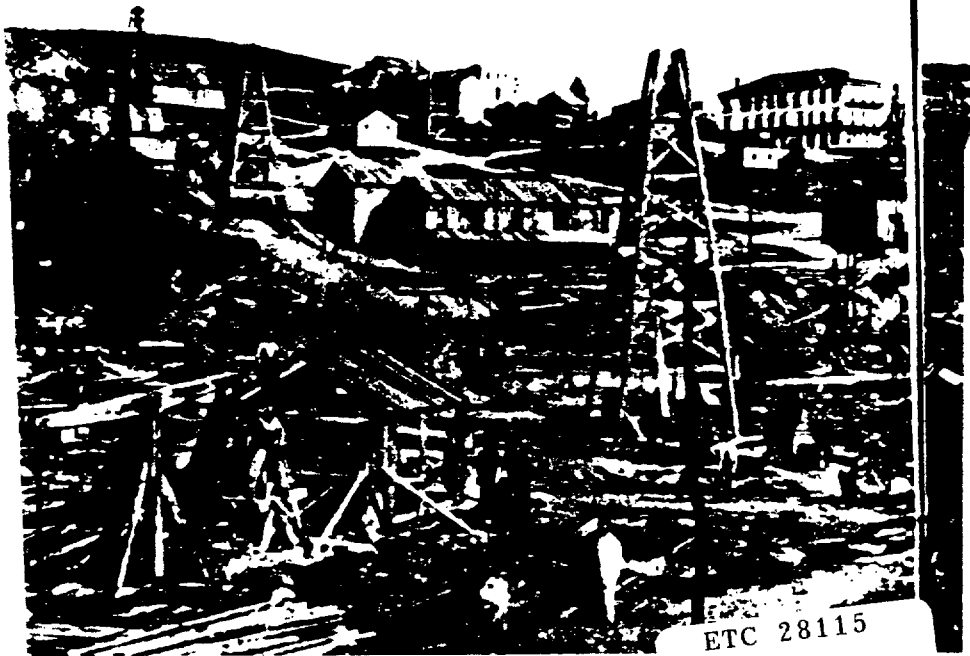


Samuel Van Syckel, who designed and built the first workable pipeline.

The first successful oil pipeline in this country, built in 1866,
was two inches of trouble five miles long



The first successful oil pipeline, built by Samuel Van Syckel in 1866, transported crude from fabulous Pithole City to the Miller Farm on Oil Creek, a distance of about five miles.



From Pithole City to Miller Farm

WHEN THE OIL INDUSTRY was in its infancy during the Civil War, transportation of crude to processing plants was one of its biggest headaches. Transportation costs soared to the point where, by January of 1865, the price of a barrel of oil in New York was \$14.90—and about one-third of this cost was due to high transportation charges.

In the Pennsylvania oil fields, a group of some 6,000 teamsters provided the only means of transportation. They severely punished those who tried to cut charges or to evade them.

Death Threat to Industry

This state of affairs threatened the very life of the industry by imposing unreasonably high charges for hauling oil to refineries and to railheads. By 1862 the situation was critical, so industry leaders welcomed the advent of J. L. Hutchings, an engineer who came to the oil fields with a new type of rotary pump and an ambitious plan to install and operate a pipeline between Tarr Farm and the Humboldt Refinery, a few miles away. A two-inch line was laid, but the joints were so poor that the line "leaked like a fifty-cent umbrella," according to the oil field press. The teamsters were delighted at the failure and again raised their rates.

However, in 1865, Samuel Van Syckel, engineer, capitalist and a real fighter, arrived at Pithole City and announced that he would build a pipeline that would operate efficiently. Further, he announced

that inasmuch as the Commonwealth had given his company the status of a common carrier, he would oppose with every legal means any opposition staged by the teamsters. These were fighting words, but cheering to industry management.

Van Syckel's line was two inches in diameter, but because he was a sound engineer, he insisted that the joints be leak-proof. The distance was about five miles between Pithole City and the railhead at Miller Farm. There were two pumping stations.

This pipeline really worked. It pumped 800 barrels of oil a day at a carrying charge of \$1 a barrel, substantially lower than the teamsters' rates.

The teamsters held indignation meetings, listened to a gospel of violence, made many attempts to destroy the new competition. Van Syckel, however, anticipated such raids and had his line well guarded. There were casualties on both sides for a period. Then teamsters recognized that it didn't pay to fight progress, and the revolt died.

Pipelines Vital to Nation

The pipeline had come to stay. Its growth and development were heavy factors in the subsequent growth of the oil industry. Today the network of pipelines, from producing oil fields to refining centers and to distribution areas, has played a major part in the economic development of the nation, greatly speeded war efforts, and generally has been a boon to all concerned. #

City to Miller Farm





A Well to Remember

The Lucas gusher in the Spindletop field near Beaumont ushered in a new era of civilization

ONCE EACH YEAR, the bustling Texas port city of Beaumont pauses in its community life to remember an event that the petroleum industry never will forget.

It is on the tenth day of January that Beaumont marks this important anniversary. For on that day, in 1901, the first well in the Spindletop field came in with a roar "heard 'round the world."

The discovery of the Spindletop field has been credited with converting Beaumont from a sleepy little village on the banks of the Neches River into one of the busiest and most progressive cities of the Southwest. But it did more than build a city, the people of Beaumont will tell you, or help to build what is now a billion dollar industry in the State of Texas. Spindletop, says an inscription on a granite memorial shaft erected at the historic site, marked the beginning of "a new era of civilization."

An Ordinary Thursday

January 10, 1901, dawned in Beaumont like any other Thursday. It was one of those days when the sun could not make up its mind whether to stay in or out. Men went to their jobs as always and children marched grudgingly off to school, while housewives set about their daily chores.

Outside the town, a few miles to the south, a trio of oil wildcatters labored at their around-the-clock drilling, as they had for months on end. They knew only too well that fortunes had been lost by other men who also thought that this piece of earth, near

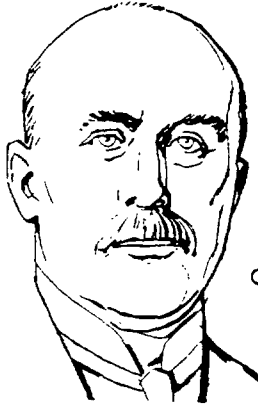
the point where Texas and Louisiana meet on the Gulf of Mexico, had oil in its depths.

The drilling crew was probing for oil in Spindletop because of the faith and persistence of one man, a man named Patillo Higgins. No geologist himself, Higgins repeatedly had expressed his conviction, apparently based on nothing more than a few surface seepages, that there was oil beneath that spot of land near his native Beaumont. Previously, with the financial backing of some of his fellow-townsmen, he had formed the Gladys City Oil, Gas and Manufacturing Co. However, all the company's many attempts to reach oil in the area had failed.

Lucas Directed New Attempt

As time went on, Higgins' efforts came to the attention of Capt. Anthony Francis Lucas, an Austrian-born mining engineer. Lucas negotiated a lease with the Gladys City Co., and started drilling. His funds soon were exhausted, but the well-known Pittsburgh partnership of James M. Guffey and John H. Galey came to his rescue. Soon Lucas was directing a new attempt to coax forth oil.

The drilling crew consisted of the Hamill brothers, Curt and Al, aided by Peck Byrd. All three had built up a reputation in the flourishing Corsicana field for their stubborn determination never to quit a job, and now they were working an 18-hour shift every third day. Doggedly, they bored into the earth, foot by foot. It is claimed that they were the first to use the rotary drill method.



Capt. Anthony F. Lucas

Then, on the morning of January 10, 1901, with a suddenness that only oil prospectors can know, out of the ground and 150 feet into the air, their oil well sprang into life. They called it the Lucas gusher, after the man who had supervised the drilling operation.

For nine days the Lucas well ran wild, spewing the equivalent of more than 800,000 barrels over the countryside. The free-flowing crude formed a lake of oil covering more than 100 acres, and spe-



cial watchmen were hard-pressed to keep curious onlookers from smoking anywhere in the vicinity. Two months later a spark—from a locomotive and not from a cigarette—set fire to the lake of oil. The 800,000 barrels went up in smoke, but the well itself had been capped and was not damaged.

By the time Spindletop was harnessed, Beaumont's population had vaulted from 8,000 to 20,000, an average daily influx of 1,300 persons during the nine days. Within a matter of months, the population reached 50,000. And still it grew. Many of those who answered the call of Spindletop, of course, became permanent residents, and today Beaumont is a city of 100,000 proud Texans.

During the boom, Spindletop holdings sold for as high as \$385,000 an acre. One piece of property changed hands 36 times in a single day, increasing in price from \$3,000 to \$36,000 in less than 24 hours. Drinking water sold on more than one occasion for six dollars a barrel. Living accommodations were in such demand that a single room brought the then-exorbitant rental of \$75 a month.

Spindletop faded out during the early 1920's, and for a while lay as an abandoned field. But she was not dead. New drilling operations were undertaken subsequently, and the field began producing once again. Spindletop still is a producing field, and is included among the all-time great oil fields of the United States. Its cumulative production since 1901 is placed at more than 135 million barrels.

City in Debt to Field

Beaumont freely recognizes its debt to Spindletop, knows that without that oil discovery it probably would have remained just an obscure Texas coastal village with a lazy river flowing past its door. Says an inscription on the monument marking Spindletop's birthplace:

"Petroleum has revolutionized industry and transportation; it has created untold wealth; built cities, furnished employment for hundreds of thousands, and contributed billions of dollars in taxes to support institutions of government. In a brief span of years, it has altered man's way of life throughout the world."

Spindletop is a part of that fabulous story. #

Spindletop monument, a towering shaft of red granite, was dedicated in 1941 to honor the Lucas well and its pioneers.

Thickening the Plot with Oil; or,



Once frowned upon, dime novels shed valuable light on early oil days

WHEN FACED with ruthless attempts to crush him, Fred Fearnot always comes out on top. This unconquerable hero is endowed with so many virtues that not even the most dastardly schemes, violence and chicanery can destroy his brilliant career as an oilman, nor sully his spotless character.

Tall, dark and handsome, young Fearnot is an amateur boxer and budding financial genius when he attempts to open a new oil field in western Pennsylvania. Then his competitors try every trick to keep Fred from drilling, producing and shipping his black gold. The most nefarious villain is "Pittsburgh Pete," a sadistic rum dealer who likes to see drunken husbands beat their wives and children.

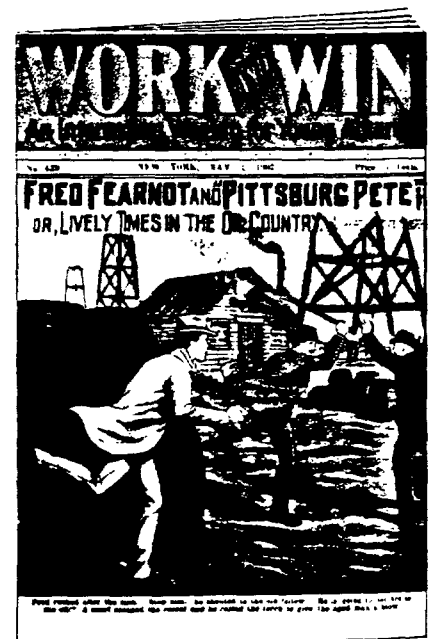
Thanks to Fearnot's acumen, courage and pugilistic prowess, he defeats his opponents, outwits Pete and brings temperance to alcoholic fathers. Fred

skillfully triples his investment and makes a fortune. One of the few logical developments is how petroleum enriches the lives of those to whom Fred supplies his oil.

In a nutshell, this is the plot and nature of a story eagerly read by thousands of boys 50-odd years ago, when the dime novel was at its height. Published in 1903 as "Fred Fearnot and 'Pittsburgh Pete,' or, Lively Times in the Oil Country," it helped sell the popular weekly, *Work and Win*.

The Fred Fearnot adventures were among the dime novels featuring locales and events related to the rising oil industry. These and similar thrillers appeared late in the past century and during the early 1900's in paper-bound volumes. Many a senior oil company executive today can recall reading them as a boy.

Rugged stamina was characteristic of the model young men who always won fame and fortune in spite of overwhelming odds. In a typical Fred Fearnot story, for example, "He broke away . . . and



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dashed in pursuit of the man with the torch. His captors yelled and pursued him, and in another moment Fred was in the roughest mixup of his life."

And in "Young Maverick, the Boy from Nowhere," a 1902 story about the early days of Texas oil, gallantry is combined with gushers, gold and skullduggery when a helpless girl is protected by a brave young man: "As the hero's friend sprang upon the derrick ladder, the villain . . . brought out his six-shooter. Young Maverick, holding the sucker-rod wrench, sprang to guard the body of the prostrate girl. 'Lay the weight of your finger on her,' he cried, 'and you'll think a cannon-ball has hit you.'"

Absurd Plots

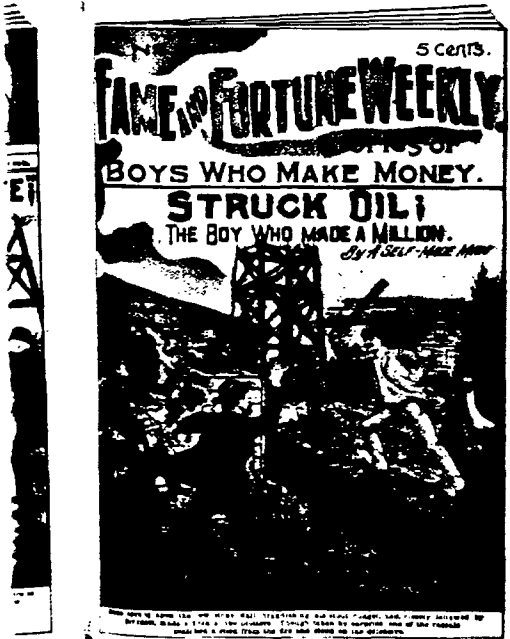
In spite of ridiculous plots, exaggerated characters and writing not only flamboyant but ungrammatical, dime novels shed considerable light on early oil field days. Their value as historical material,

however, has been recognized only quite recently.

Most of the stories were by authors who knew their subject at first hand. There are accurate descriptions of how nitroglycerine was used to blow oil wells, accounts of early refining methods, how oil was transported, the way leases were handled and financial hazards involved in the infant industry. Although offered with a sugar coating of fiction, dime novel writers often presented factual truths in more humanized and interesting ways than historians in formal treatises.

From the perspective of the half-century or more since dime novels about oil first appeared, it is almost impossible to know exactly how many were written and published. As recently as 1950, only a dozen had been found. Now it is certain there were at least 15, and perhaps more.

Like their companion shockers about train robberies, the wild west, the swindling of widows and orphans and the hero's rescue of the inevitable maiden in distress, the predecessors of today's comic



books were printed on cheap pulp paper. They were sold more often for a nickel than for a dime.

Such flimsy journals were stuffed hastily into a boy's shirt or pocket when a teacher or parent interrupted clandestine reading. This rough treatment of already well-thumbed copies reduced them to tatters in short order, and they were soon discarded. Besides, there was always youthful preference for the latest and still more thrilling adventures of fictional idols. These and other circumstances provided an unfavorable environment for the preservation of dime novels.

Publications Now Valuable

That is why the once lowly publications are so scarce and valuable today—worth anywhere from \$3 to \$100 or more per copy. Collectors and some libraries scour the country's attics and forgotten crannies, hoping for new finds. The largest collection is undoubtedly the 50,000 titles owned by Charles Bragin of Brooklyn. Famous men in all walks of life belong to Mr. Bragin's Dime Novel Club, which distributes facsimile copies of selected originals.

Of the 15 known oil industry nickel and dime

stories, Ethyl has 14 in its collection of Petroleum Americana. Dating from 1880, these rare publications help make the Ethyl library complete and diversified.

All the publications have alluring "or" subheadings to amplify the title. Some examples are "Treasure by the Barrel; *or*, The Cherokee Boom;" "Struck Oil; *or*, The Boy Who Made a Million;" "Fred Fearnot and the Promoter; *or*, Breaking Up a Big Scheme;" "The Bradys in Oil Country; *or*, The Mystery of the Giant Gusher;" and "A Stroke of Luck; *or*, The Boy Who Made Money in Oil."

The missing blood-curdler which Ethyl is attempting to acquire is "Nick Carter Strikes Oil; *or*, Discovering More than a Murder," a *Nick Carter Weekly* item of 1902. The Company also is continuing its efforts to identify and obtain any more dime novels of this kind which may not have come to light.

A more widespread use of photography, followed by the nickelodeon and then full length moving pictures, put an end to the dime novel era before World War I. But fortunately for nostalgic adults, enough copies remain in which boyhood excitement can be recaptured, if tempered by a more mature perspective. #



Two of the hundreds of visitors who saw the Ethyl dime novel collection when it was in the "Petroleum in Fiction" display at Northwestern University's Deering Library.

FEBRUARY 2, 1923

That Day in Dayton

ETHYL GAS ANTI-KNOCK
GASOLINE
Product of the General Motors Research Corporation

Public acceptance relieved hopeful tension when "Ethyl" gasoline was introduced

By Harry Mack



Harry Mack, the author of this article, was born in Dayton in 1893 and has lived there all his life. He joined General Motors Corporation in that city soon after completing his education at St. Mary's University (now the University of Dayton). In 1923, upon the formation of General Motors Chemical Company, (predecessor to Ethyl Corporation), he was named business and traffic manager and purchasing agent of that firm. He joined Ethyl upon its formation in 1924. Mr. Mack was manager of the Company's offices in Dayton for 25 years, and for the three years immediately preceding his retirement in 1958, he was marketing advisor to Ethyl's Central Region.

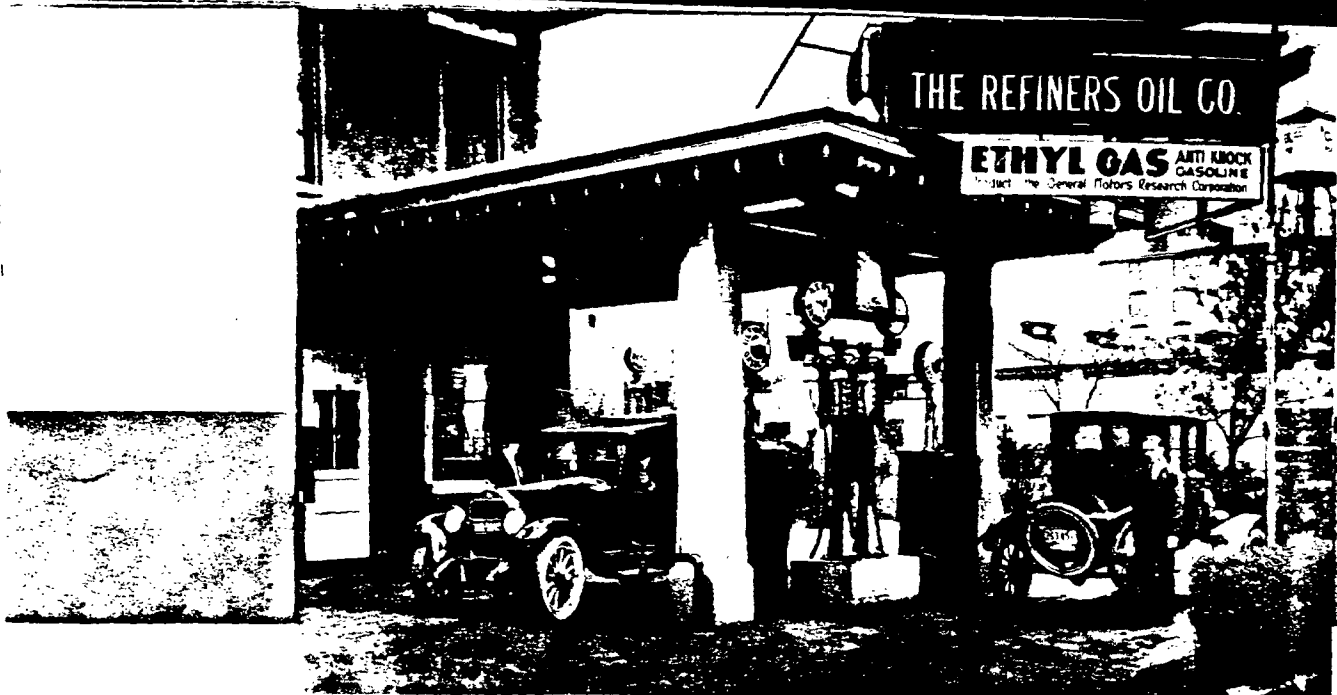
—The Editors

THIS WAS THE DAY we all had been waiting and working for. It was Friday, February 2, 1923, the first day "Ethyl" gasoline was sold.

The service station where gasoline improved with "Ethyl" antiknock compound was marketed for the first time was operated by The Refiners Oil Company, at the corner of Main and Sixth Streets in downtown Dayton, Ohio. In big red letters, a sign proclaimed "ETHYL GAS, ANTI-KNOCK GASOLINE."

The research which led to the development of "Ethyl" antiknock compound for improving gasoline quality had started in Charles F. Kettering's then privately owned laboratory in Dayton back in 1916. Along the way, "Boss" Ket had sold his laboratory to General Motors and joined that company. The later successful stages of the search for a commercially practical antiknock agent were therefore conducted under General Motors auspices.

It was pure coincidence that the first person to buy "Ethyl" gasoline on the day it was offered to the public for the first time was a General Motors man. He was F. M. "Mike" Redelle, manager of the local GM employee recreation center in Dayton, who was well acquainted with what we had been doing to make gasoline better.



This is how the service station with its new sign and pump looked when "Ethyl" gasoline was first sold to the motoring public by The Refiners Oil Company in Dayton, Ohio.

With his overcoat collar turned up that dark, raw February morning, Redelle swung his touring car into the driveway about 8 o'clock. All of us concerned with the new venture were waiting anxiously and hopefully.

Literally and figuratively, the paint on the "Ethyl Gas" sign was barely dry. Russell Wells was the laboratory man who spotted Redelle as he drove up to our special gasoline pump.

"How are things going?" Mike asked.

"Ask me tomorrow; I'll know better then," Wells replied. "We've just got everything set. In fact, you're the first customer."

Actually, we didn't have to wait until the next day for our answer. Before the first day was over, motorists were lining up to try our new product. It was a success from the start. But little did those first customers realize their purchases would be the first of billions of gallons of "Ethyl" gasoline to be sold. Neither had those drivers any way of knowing the important part "Ethyl" antiknock compounds were to play in the development of better engines, better fuels and efficient and economical motorized transportation.

Besides Mike Redelle, another first-day customer who was to earn a special place in Ethyl Corporation annals was Fred Lewis, transportation superintendent of the Dayton Power and Light Company. As Fred drove into the station, his car was knocking like the seven Furies. I can't honestly say his car

purred like a kitten the moment it left the station, but it wasn't too many miles before he noticed a decided change for the better.

At Dayton Power and Light, Fred Lewis supervised 65 trucks and automobiles. Naturally he was always on the lookout for something that would improve the fleet's operation and also reduce costs. Because of the difference "Ethyl" gasoline made in his own car, Lewis lost no time in telling O. B. Reemelin, the utility company's general superintendent, about the new fuel. In due course, arrangements were made with the research laboratory and Refiners Oil to use the Dayton Power and Light fleet to test various experimental and improved mixes of "Ethyl" fluid and gasoline.

First Fleet User

On June 1, 1923, the utility became the first of thousands of operators of large numbers of motor vehicles to use "Ethyl" gasoline to help solve fleet problems. Dayton Power and Light soon found that the improved motor fuel cut operating and maintenance costs by two-thirds.

Of all those interested in the first sale of "Ethyl" gasoline, two groups were especially concerned with



Thomas Midgley, Jr., who discovered the antiknock properties of tetraethyl lead used in "Ethyl" fluid since 1923.



"Mike" Redelle, first to buy the improved gasoline, was still a regular customer when this picture was taken 25 years later near his Dayton home.

how motorists would take to this new motor fuel. To the laboratory staff, public response would spell the success or failure of long years of faithful and often heartbreaking research efforts. To officials of The Refiners Oil Company, then the largest independent in Ohio, it was a daring business venture yet to prove its soundness.

Refiners Oil had spent weeks making careful arrangements for the big day. As purchasing agent and business manager of the General Motors Research Laboratory, I worked closely with the Refiners people. The oil company had ordered a special globe for the pump from which the "Ethyl" gasoline was to be sold, and had the big sign painted to help attract customers. Refiners had chosen its service station at Sixth and Main as the world's first outlet for "Ethyl" gasoline for two reasons: it was centrally located, and it was next door to the company's office building.

We had planned to start selling "Ethyl" gasoline for the first time on February 1, not February 2. And we would have made it on the first of the month except that Harry Reehl, a Refiners driver-salesman, was delayed in delivering his gasoline that day. We had no choice but to put off the initial

sale, but at least we got ready. Arthur B. Brubaker, a General Motors chemist, and Charles P. Harding, a laboratory worker, were on hand to blend "Ethyl" fluid with the gasoline after Reehl arrived.

That first blending of "Ethyl" fluid and gasoline was far different from the scientific, controlled way in which it is done today at refineries. We put a suitable amount of fluid into the service station's storage tanks as they were being filled with gasoline from Reehl's truck. This was done on the basis of 3 cc. per gallon. Then Arthur Kelsey, the station manager, tested the pump and its glass bowl.

An Early Start

The next day—that eventful February 2—Brubaker, Harding and Wells were at the station at 6 a.m. to take care of last-minute details. I arrived shortly afterwards, just ahead of most of the Refiners Oil executives.

Four men were officially on duty at the service station. In addition to Kelsey, the manager, there were John B. Handle, assistant manager, and two high school students who were part-time attendants.

The station itself had been scrubbed from top to bottom, and the driveway had been swept clean.

It's hard now, so many years later, to describe the tension we all felt. After making so many laboratory and road tests, we had a new product which we were sure of. There was no doubt in our minds that there could be little progress in automotive engines until gasoline antiknock quality improved. But would the motoring public buy the new gasoline? We didn't begin to relax and smile at each other until we had had several customers. Then we knew that our novel experiment was off to a happy start.

Midgley Enthusiastic

None of the laboratory group was more cheered by the way things went than Thomas Midgley, Jr. Under "Boss" Kettering he had headed up the research which finally resulted in the discovery of tetraethyl lead as an effective antiknock agent, then as now the key ingredient of "Ethyl" fluid. Midgley drove back and forth from the laboratory to the service station at least a half dozen times that day.

He asked questions. He talked with some of the "Ethyl" gasoline customers. Now and then he joked with the Refiners Oil officials. The day was a red letter one for us all, but mostly for Tom Midgley. His knowledge, his patience and his understanding had made this new gasoline possible.

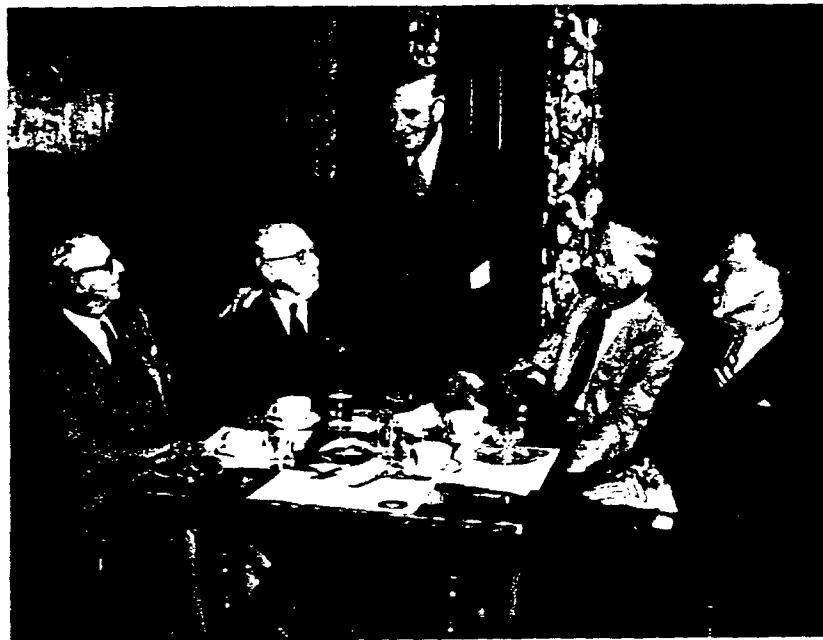
It was Midgley too who had "sold" Refiners Oil

on becoming the first company to market "Ethyl" gasoline. Dayton Power and Light also became the first fleet consumer through Midgley's efforts. Tom was just as good a salesman as he was a scientist.

Cheered by the success of the first day's sales, Refiners a few weeks later introduced "Ethyl" gasoline at another of its Dayton outlets, at South Main and the Cincinnati Pike. On some days, as much as 80 percent of all purchases at the two stations was "Ethyl" gasoline. By mid-summer, motorists could buy the new motor fuel at any of the 75 service stations which Refiners Oil operated throughout Ohio. The company became the talk of the oil industry.

Before long, other refiners, marketers and distributors became interested. Success with experimental sales during the summer of 1923 prompted Standard Oil of Indiana to sign the first formal contract for supplies of "Ethyl" antiknock compound from the General Motors Chemical Company, predecessor of Ethyl Corporation. Other major oil companies soon became customers too.

The new business venture was to have its ups and downs for a while, of course, before "Ethyl" won full recognition and acceptance. But so far as I am concerned, the biggest and most important question mark was erased on that unforgettable day in Dayton—February 2, 1923. #



Recalling the memorable first day's sale at a reunion luncheon a number of years ago were former Refiners oilmen W. E. Talbot, R. M. Beard, K. S. Meuche and F. S. Parratt. Standing is Harry Mack of Ethyl, author of this article.

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Born in Freedom ...

Working for Progress ...



That's the Story of OIL'S FIRST CENTURY

Both America and the oil industry have come a long way since that August day in 1859 when Edwin L. Drake drilled the first oil well at Titusville, Pa.

The development of the oil industry has closely paralleled the development of America for the last hundred years. A free climate nourished them both, provided the atmosphere in which they grew best. And, though each has moved forward magnificently, the world's people expect that, for both, the best still lies ahead.

The oil industry has made many contributions to America's ever-rising standard of living. Nothing in this land of ours moves, but that oil helps to move

it. Nothing is fabricated, but that oil research helps make it possible or helps make it better.

But oil's men and women consider this merely a step along the way. During oil's next century there will be even greater things from oil. Lots of progress has been made in oil's first century—but *the best is yet to come.*



PENNSYLVANIA

OIL CENTENNIAL

MAGIC CIRCLE

Union City

THE DRAKE WELL, birthplace of the oil industry, is part of Drake Well Memorial Park in Titusville which also includes the Drake Museum. Seeing local history is part of the magic that's all around you—any time you pick up a map and start driving.

OIL CREEK, the shallow vital waterway of the area, was used in the boom days to transport oil by flatboat. Today, streams like this are more noted for their scenery, but as you drive along the banks, there's history lurking there.

THE STATELY HOMES of early oilmen are still to be seen—like "the old McKinney place" in Titusville. When you drive by such a landmark, anywhere, it's fun to know what once happened there—and to see what it looks like now.

ONE OF THE OLDEST PRODUCING WELLS can be seen at Oil City. Called "McClintock No. 1" it was drilled in August 1861, and is still producing oil today. In your own Magic Circle, there are "oldest of its kind" discoveries too.

Meadville

Titusville

Petroleum Center

Pithole

Oil City

Franklin

On August 27, 1859, a man named Drake drilled the first oil well in the United States—and quickly turned this quiet section around Titusville, Pennsylvania, into a roaring area of colorful boom towns. And here, the Petroleum Industry was born.

Today, the mementos of those times make this area an "Oil Centennial Magic Circle"—and a perfect example of the kind of thing you can find in your

own area. Because all around you, anywhere you live, there's a "Magic Circle" full of fascinating things to see and do by car.

This series of advertisements is published by Ethyl Corporation, to help you get more enjoyment out of your car. Ethyl Corporation manufactures antiknock compounds used by oil companies everywhere to improve their gasolines and your driving pleasure.



ETHYL NEWS

JULY-AUGUST 1959



ETC 28128

ETHYL NEWS

JULY - AUGUST 1959



THE COVER pictures a good example of leisure-time use of the family automobile—in this case in Wyoming's Teton mountain range. For a discussion of how increasing such use of the car will help boost gasoline sales, see "Expanding the Demand," starting on page 8.



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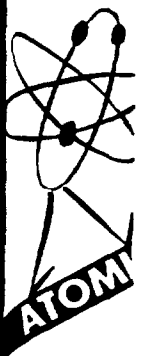
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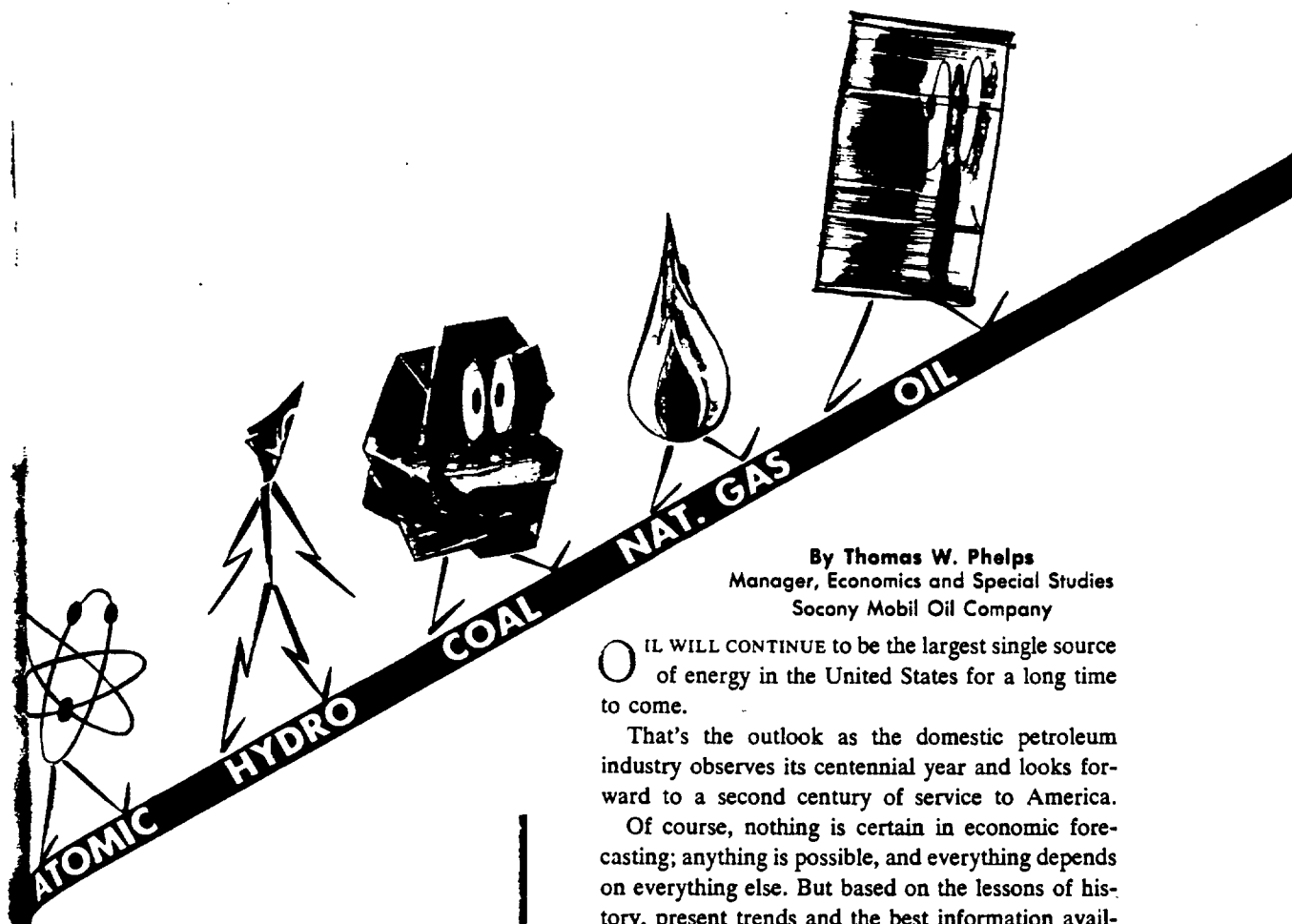
Petroleum

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assured

ETC 28129

Oil's out front



**Petroleum's place as the greatest
single supplier of energy is
assured for the foreseeable future**

By Thomas W. Phelps
Manager, Economics and Special Studies
Socony Mobil Oil Company

OIL WILL CONTINUE to be the largest single source of energy in the United States for a long time to come.

That's the outlook as the domestic petroleum industry observes its centennial year and looks forward to a second century of service to America.

Of course, nothing is certain in economic forecasting; anything is possible, and everything depends on everything else. But based on the lessons of history, present trends and the best information available about the future, oil looks like a sure thing to lead the energy parade through the next decade, at least.

Looking back—and that's always a prerequisite to looking forward—it's obvious that oil's role has been a rapidly expanding one. In 1928, it was a poor second to coal, providing a little over one-fifth of the country's total energy requirements. By 1948, substantially more than one-third of all energy was derived from oil. And in 1957, oil supplied 44 percent, having ousted coal from first place in 1950.

Reflecting the nation's expanding economy, total consumption of energy has almost doubled in the

last 30 years. It rose from the equivalent of over 10½ million barrels of oil a day in 1928 to the equivalent of more than 20 million barrels a day in 1957. By 1968, it is expected to be up almost 30 percent over present levels, to about 28.5 million barrels a day.

Despite this substantial rise in total energy consumption, and an accompanying increase of almost 50 percent in oil consumption, it is not expected that oil's *proportionate* share will go up between now and 1968. As a matter of fact, it is expected to be off by possibly one percent—to about 43.

Industry's Share to Increase

Viewing oil and gas together, however, the industry's share of the energy market is expected to increase sharply. The explanation is found in natural gas. In 1928, oil and natural gas together supplied 29 percent of the country's total energy requirements—oil 22 percent and gas seven percent. In 1968, it is estimated, they will supply 72 percent—oil 43 percent and gas 29 percent.

Now let's look at the contributions of coal, hydroelectric power, and in 1968, atomic energy.

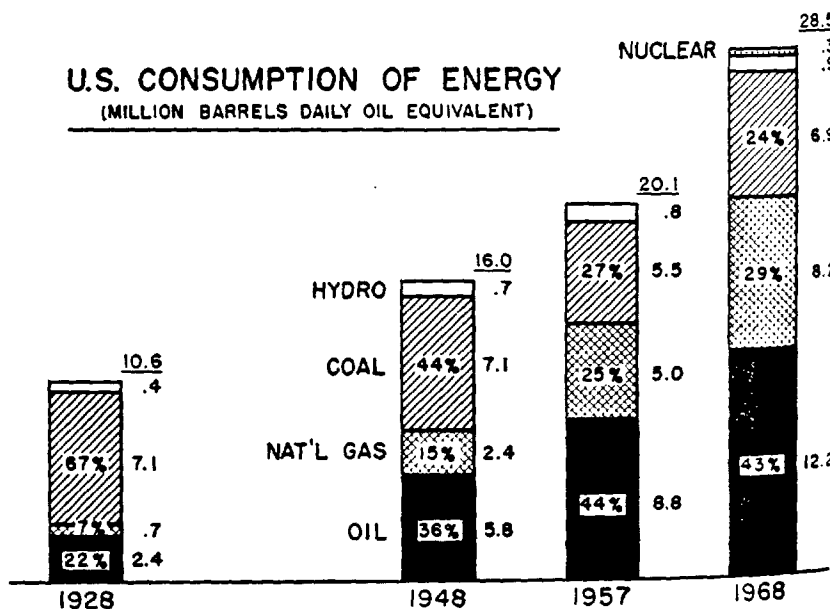
It appears that coal's share will decline to less than one-fourth of the total energy market by 1968, from a little over one-fourth in 1957, and more than two-thirds in 1928. At the same time, it is



Much of the upswing in natural gas consumption will result from further extension of pipelines.

Future energy needs will be met largely by increases in the consumption of oil and natural gas.

U.S. CONSUMPTION OF ENERGY
(MILLION BARRELS DAILY OIL EQUIVALENT)



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expected that the continuous decline in the actual tonnage of coal consumed each year is ending.

Hydroelectric power's proportionate share—less than five percent—has not changed significantly over the last 30 years and no great fluctuation seems indicated.

As awesome and spectacular as atomic power's longer-range potentialities are, its high cost and limited use indicate that it probably won't supply more than one percent of all energy used in this country by 1968.

To reach the 12,200,000 barrels a day consumption figure that has been forecast for 1968, domestic oil demand will increase at a somewhat slower pace than it has over the years from 1928 to the present. The same is true of natural gas, although most of the slackening in the demand for natural gas is expected to fall in the 1963-1968 period.

Now that these forecasts have been made, let's turn to some of the reasons and reasoning behind them.

Over the past 50 years, gross consumption of energy (energy input) has been growing at a rate lower than that of the index of industrial production. Yet our economy is becoming increasingly energy intensive. The explanation for this seeming contradiction is found in the increasing efficiency with which fuels are utilized.

Useful Energy Trends

In 1900, only about 11 percent of gross energy input was converted into useful energy, but by 1950 about 30 percent was being utilized. Now the rate of growth in fuel efficiency is beginning to slow down. Consequently, barring some major technological breakthrough—such as a cheap, highly efficient fuel cell—gross energy input may be expected to increase at a slightly higher rate over the decade ahead than in the past.

The second factor considered in forecasting the demand for energy is an estimate of the growth in the index of industrial production over the next 10 years. This can be put at about 3½ percent a year, or 40 percent for the next decade, and is based on

Although no longer first as an energy source, coal will be more essential in generating electricity.

forecasts of population, labor force, work week and productivity.

Earlier, the belief that the decline in the tonnage of coal consumed each year is ending was cited. Why? Because coal already has lost essentially all of its vulnerable home heating and railroad markets. From here on, the demand for coal should increase by virtue of its strengthening position in the generation of electricity and its role in coke production.

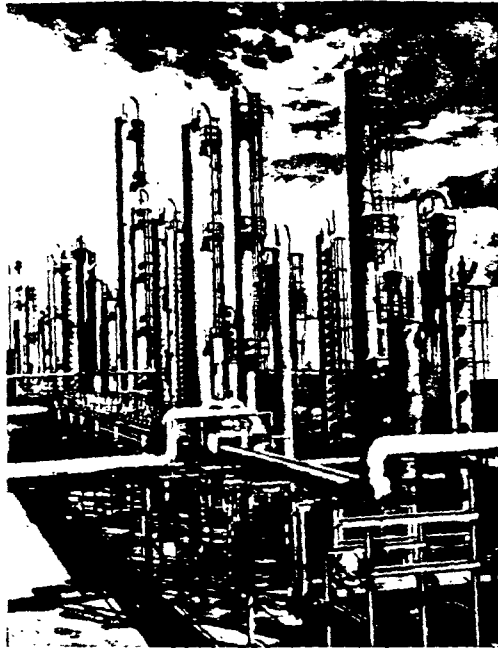
Natural Gas Prices

The gradual tapering off of the rapid expansion in the use of natural gas is a possibility to be reckoned with. This appears particularly likely if economic forces are permitted to determine the well-head price for gas. In 1938, gas was sold for the equivalent of 25 cents a barrel for crude oil, and today it is sold for the equivalent of something like 75 cents a barrel for crude oil. Crude prices have moved up with rising costs of production, but natural gas has lagged. If the rising trend of prices for new long-term contracts for gas is any guide, the price for this energy source will move nearer its economic level, despite government regulations.

On the whole, oil can be expected to become more competitive with gas in the northern areas of the country in the coming decade, and there should be some growth in the domestic heating oil market.

The forecast of expanding use of oil at about three percent annually assumes a shift in the pattern of demand. In 10 years, a larger portion of the oil barrel will be used for transportation, for petrochemicals and for other new uses for hydrocarbons.





Modern refineries and petrochemical plants are converting oil into more and better products.

A smaller portion of the barrel will be used for the generation of heat. Both in industrial uses and in home heating, residual and distillate oils are losing some of their share of the growing market to other energy sources—natural gas today and possible electricity generated by atomic energy and coal in the more distant future. Any sharp increase in the efficiency of transporting gas and electricity should accelerate this trend.



Locating new reserves successfully gives assurance of ample crude for the future.

As the industry looks to the future, there are indications that it may face many changes. And every change brings both opportunities and problems.

Opportunities for the oil industry have to do with new and expanding markets that accompany every material advance of mankind. The most promising new market at the moment is petrochemicals. Although it is still small, it will grow and there will be others of comparable importance.

Competition for Work

The problems have to do with new competition from radically changing ways of doing the world's work. The fuel cell which has a theoretical efficiency more than double that of the best motors in use today has been mentioned. Another might be permanent lubrication of automobiles—a development that would wipe out a substantial market. In the background there is the alchemy of the new atomic science.

But this is no counsel of despair. One of the oil industry's most difficult problems—that of insuring an adequate supply of petroleum—already is pretty well in hand. Speaking only of liquid petroleum reserves, 10 years ago the free world had a 23-year supply based on the 1948 level of production. Today, it has a 30-year supply based on the much larger 1958 production. And as a secondary reserve, there are enormous quantities of shale, rapidly nearing economic utility.

Oil's Better Value

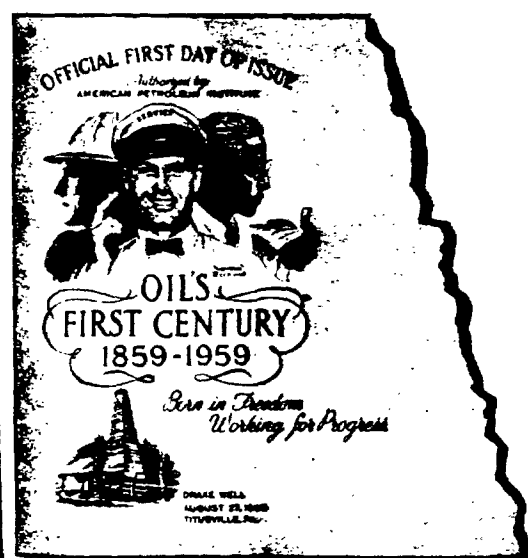
Petroleum got where it is today by giving mankind a better value. Petroleum's place in the future energy requirements of the United States will depend on the ability—and the will—of the oilmen, and governments, everywhere, to continue to give better values.

Oil progress is not inevitable. It's possible to kill the goose that laid the golden eggs. But if the oil industry meets its problems, improves its methods, and cuts its costs, oil's place in the future energy requirements of the United States is out front for a long time to come. #



2 Billion Tributes to Oil

That's the number of centennial stamps the Post Office Department is issuing

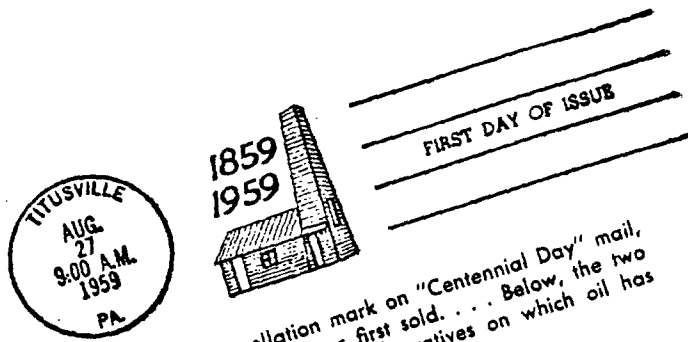


Thousands of the oil centennial stamps cancelled in Titusville on August 27 were affixed to envelopes bearing this design.

BACK IN 1859, when the modern petroleum industry was launched on the oil that flowed from Edwin L. Drake's historic well, adhesive postage stamps had been in use in the United States a scant dozen years. The Post Office Department had been organized as early as 1789, but the volume of mail was still a comparative trickle.

This year, as the oil industry marks its 100th anniversary, the American people will send and receive over 61 billion pieces of mail. This is more than 350 pieces for every man, woman and child in the United States and two-thirds of the world's total. In paying postage on this staggering amount of mail, they will use more than 24 billion adhesive postage stamps, 2½ billion stamped envelopes, 3 billion postal cards, and 28 million air letter sheets. This postage will cost over \$1 billion and about \$1¼ billion more will be spent for permit mail.

Starting August 27, some 120 million of the 24 billion adhesive postage stamps in use this year will



Above, the cancellation mark on "Centennial Day" mail, when the new stamp was first sold. . . . Below, the two earlier United States commemoratives on which oil has been featured.



be the 4-cent Petroleum Industry Centennial issue, first placed on sale at the industry's birthplace—Titusville, Pa.—on its birthday. The stamp helps focus attention on the industry's successful completion of its first century. It bears the inscription: "U. S. Postage, 1859-1959, Petroleum Industry, 4¢," and is adorned with New York artist Robert Foster's conception of a modern drilling rig.

The new stamp, as most of the country's estimated 20 million regular stamp collectors know, is classed as a commemorative, one of five categories in which adhesive U. S. postage stamps are grouped. Commemoratives were first issued to mark the Chicago World's Fair in 1893. Since then individuals and events that are part of the nation's heritage have been honored on commemorative stamps. The Post Office Department now issues about a dozen commemoratives each year.

Other Categories

The other categories of adhesive U. S. postage stamps are: (1) Regular stamps, ranging in denomination from ½ cent to \$5, and traditionally depicting former presidents and other prominent persons, and national shrines. Twenty-three, issued since 1954, are now in use; (2) Memorial stamps, issued infrequently to honor American officials who die in office; (3) Air mail stamps, first issued in 1918, and usually depicting the history of aviation

Foreign issues with oil themes represent



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and air mail developments; and (4) Special stamps used to prepay fees for special services such as special delivery and registered mail.

The story behind the issuance of the oil centennial stamp parallels that of other commemoratives.

Several years ago, the American Petroleum Institute, presidents of a number of oil companies, interested philatelists and other citizens wrote the Postmaster General, suggesting that such a stamp be issued. The suggestion was referred to the Citizens' Stamp Advisory Committee, a seven-member group of prominent philatelists and designers and a representative of the United States Information Agency. This Committee advises the Post Office Department on "subject matter, designs, production, and issuance of postage stamps with the most appropriate and appealing themes."

The API sent to the Committee suggestions for the stamp which had originated in oil and philatelic groups.

After the Committee had approved the idea of the stamp, its recommendation was forwarded to the Postmaster General, who has the exclusive and final authority to determine what postage stamps are issued. The Committee selected the artist, considered the several designs he submitted, and selected one which it recommended for adoption.

The United States is one of 37 countries around the world which includes designs pertaining in some

way to the oil industry on 423 different postage stamps. Previously, the two United States postage stamps portraying some phase of petroleum were the yellow, three-cent California statehood stamp of 1950, which marked the 100th anniversary of the Golden State's admission to the Union, and the three-cent violet-brown American Chemical Society issue of 1951, commemorating the organization's 75th year. The former showed the tops of two rigs and the latter pictured refinery towers.

Foreign Issues

Foreign countries that have issued petroleum postage stamps represent practically every continent and both sides of the Iron and Bamboo curtains. They range geographically from Canada to the Straits Settlements and alphabetically from Argentina to Venezuela. They depict natural asphalt deposits, drilling rigs, pipelines, tanks, tankers, tank cars and trucks, refineries, gas flares, producing fields, oil lamps and oil industry workers.

If the oil centennial stamp follows the pattern of most U. S. commemorative issues, the supply of 120 million that has been printed will probably be sold out within six months.

As they speed the country's mail on its way, the trucks, cars, trains and planes carrying this mail will be powered by products of the same petroleum industry which the new stamp honors. =

Stamps represent oil throughout the world. (Source: Stamp collection of Luther Williams, Sunny Mid-Continent Oil)



Expanding the Demand

Effective promotion of greater leisure-time use of the family automobile can help boost gasoline sales

By Russell B. Weston
Advertising Manager, Ethyl Corporation

CONTRADICTION AS IT MAY SEEM, the American people, who have more leisure time on their hands than ever before, are using their cars less for pleasure driving.

Reversing this trend looks like it may be a rather tough assignment, but the rewards would be well worth the effort. For in promoting greater leisure-time use of the family automobile lies one of the greatest opportunities for increasing the sales of gasoline and other service station products.

Just how much would added use of the family car increase sales? No one knows exactly, but a couple of examples quickly illustrate its tremendous potential:

If the average car owner were to drive only two more miles a day, it would increase annual passenger car consumption of gasoline by nearly eight percent, or more than 2½ billion gallons a year.

If every car owner used just one extra tankful of gasoline, it would reduce gasoline stocks by some 20 million barrels, or nine percent.

A few years ago, there were few indications that



Many families are spending leisure hours at home, instead of using their automobiles for trips and other recreational purposes.



the oil industry would soon be faced with a challenge to increase gasoline consumption. Sales were going up at a healthy four or five percent each year. The industry was operating at a rate very near capacity, and from all outward appearances, gasoline would continue to sell in increasing amounts.

But while everything was rosy on the surface, there were some underlying trends and developments that indicated all was not well.

For one thing, there was a great deal of competitive advertising. The bus lines were saying "Go by bus—leave your car at home." Railroads were pointing to traffic congestion and saying "Take it easy—take the train." The airlines were advertising economy fares which they said "cost you no more than the same trip would by car!"

The fact that gasoline sales were on the way up was due to the increasing number of cars on the road—not to increased car use. As a matter of fact, average annual mileage per car was declining. It dropped from 9,723 in 1950 to 9,500 in 1953, and declined still further to 8,950 in 1957.

This trend is puzzling in the light of economic and social developments. It's a well known fact that there has been a broad population trek away from the cities and into the suburbs. As a result, people rely heavily on their cars. Research studies show that seven out of every ten drivers consider their family cars so important they couldn't do without them. And yet, this greater reliance has not had the effect of increasing the total number of miles that automobiles are used each year.

Enjoy Driving

Neither have higher living standards which provide people with more leisure time to spend with their families. Two out of every three car owners say they enjoy driving because it is relaxing, provides fun and recreation, and takes their minds off their problems. But on the other hand, fully 50 percent of all motorists say they almost never do any pleasure or casual driving.

Economics isn't the reason either. Most people are pretty well informed about what it actually costs

them to own and operate a car. They know that the more they drive, the cheaper by-the-mile it becomes. At least part of this awareness stems from Ethyl's initial market expansion program — the "Drive More" campaign, launched five years ago. But motorists apparently still need a psychological urge to take their cars and "go for a ride."

Perhaps there is some way to dramatize that one extra tankful of gasoline that was mentioned earlier—a tankful that can provide between 200 and 300 miles of enjoyable travel and recreation for the whole family.

Another suggestion with a great potential is that the industry support efforts to reform the calendar. Under proposed changes, all present mid-week holidays would be shifted to Monday, creating three-day weekends. It's easy to see how tremendously this would increase driving.

Boom in Boating

In still another direction, there is an opportunity for the industry to capitalize on the boom in boating. Each year, more people are hauling boats on trailers over highways to lakes and rivers. Others are using their cars to go where their boats are moored. This all means extra gallonage for the cars and for the boats.

Just as an example, it is reported that there were 5½ million outboards in use in 1958. But the full potential of this activity is not being realized because of the lack of marinas, launching ramps and facilities to buy fuels. A survey by the National Association of Engine and Boat Manufacturers reports that two million additional U.S. families would buy inboard or outboard motor boats and sail boats if there were adequate berthing facilities.

The oil industry can be of help in focusing attention on this problem and possibly individual companies can turn it into a sales opportunity.

Perhaps, by spurring greater car use, the industry can help families to use their leisure time more constructively—seeing historical and other spots which provide recreation, as well as education for their children.

A very important consideration in selling greater car use is the lady of the house. Many of the decisions on what the family is going to do are made

by wives. If they decide on a picnic in the country, then it's probable there'll be a picnic. If they say "Stay home," then all too often the car sits idly in the garage, without benefiting anybody.

Studies show that for some reason women do not read oil advertising. If they are to be reached effectively and convinced that there are opportunities for them and for their families to enjoy the family car, then it probably is going to take a special promotion geared to their interests to do it.

Families Together

Overall, the oil industry may be able to help restore the former status and, indeed, the prestige of the family car. Perhaps it should help bring back the idea of a family going for a Sunday afternoon drive. Perhaps it should encourage more weekend trips in the light of greater leisure time.

In any event, simply by promoting greater car use among American motorists, families may be encouraged to do more things together. And this, everyone will agree, is a highly desirable goal.

Of course, many members of the petroleum industry already are carrying out market expansion programs. They are doing notable work through their distribution of road maps and travel informa-

The boating boom can help gasoline sales. More people than ever are hauling boats to launching sites and are driving to where boats are moored.



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If the average car owner drove two more miles a day, annual passenger car consumption of gasoline would increase by nearly eight percent, or more than 2½ billion gallons a year.

tion. A number are employing advertising, direct mail, radio and television to encourage greater car use. And still others have produced motion pictures on the scenic wonders of America.

The new and growing leisure of the American public represents possibly the greatest opportunity that gasoline marketers have ever had. They can capitalize on it in their advertising and sales promotion by encouraging more driving.

Reaching Common Goal

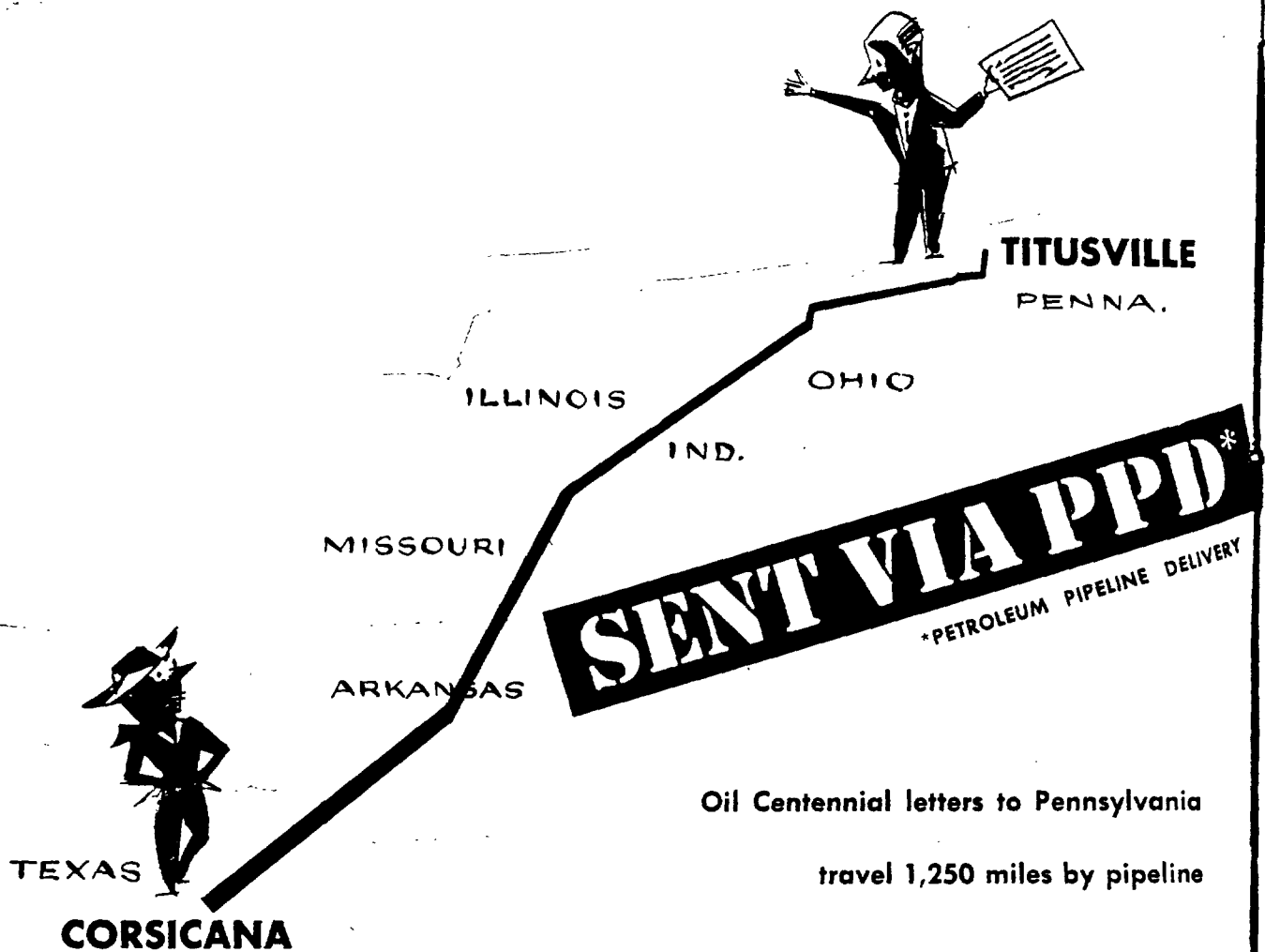
This is not to say that every company must take the same approach or use the same theme. But if all direct their efforts in the same general area with the same purpose in mind, they cannot help but be effective in achieving a common goal.

To be fully successful, this kind of promotion should be outside the normal area of competitive advertising. Naturally, an effort such as this will benefit the industry as a whole, but at the same time it cannot help but benefit individual marketers. #

Ethyl Lends a Hand

Recognizing the importance of "expanding the demand" for gasoline and other service station products, Ethyl Corporation has, for several years, been cooperating with the oil industry to promote increased use of the family car for leisure-time driving. As a part of this effort, the Company formerly sponsored the "Drive More" campaign. Currently, it is sponsoring the "Magic Circle" advertising and publicity campaigns. In these, Ethyl is telling the nation's motorists of the Magic Circles of fun and recreation located all around them, and is suggesting where and how they can use their cars more for day and weekend trips. The advertisement on the back cover of this issue of ETHYL NEWS is typical of the Magic Circle messages that appear regularly in some of the country's most widely read magazines.

—The Editors



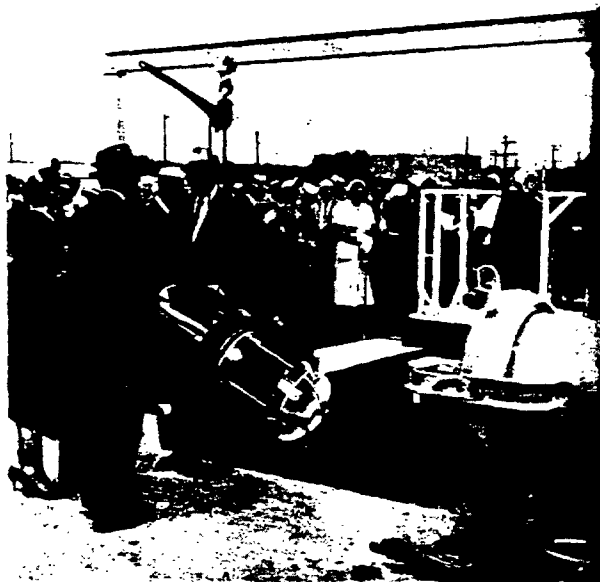
**Oil Centennial letters to Pennsylvania
travel 1,250 miles by pipeline**

By Thom Yates

THE PRESENTATION, late in August, of a folder of letters to Gov. David L. Lawrence, of Pennsylvania, marked the completion of one new chapter and perhaps the beginning of another in communications and oil industry history. The letters—from the governors of 32 other oil-and-gas-producing states—extend to Governor Lawrence greetings and congratulations on the anniversary of the founding of the oil industry in his state 100 years ago.

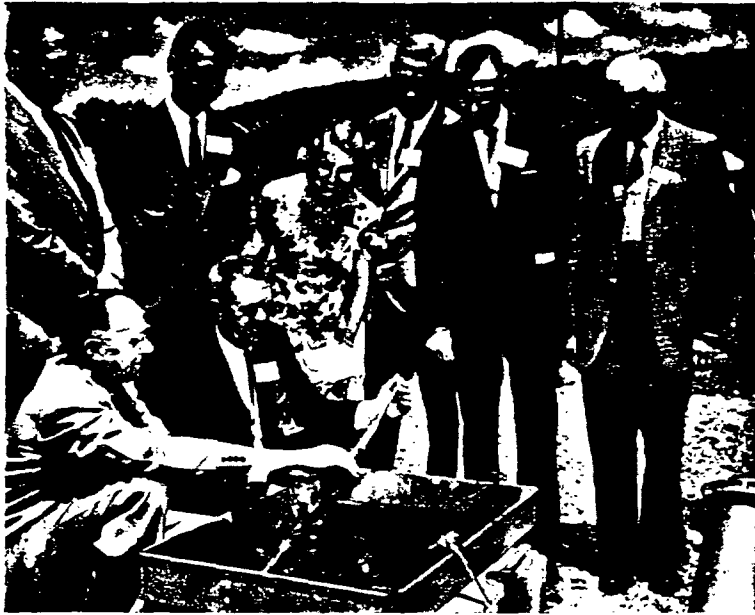
It was the method of delivering these letters, rather than their contents, that makes them so unique. The letters were transmitted, on microfilm, through petroleum pipelines for a distance of 1,250 miles—the first time that messages had ever traveled in this way.

That another new chapter in communications may have begun was hinted by George S. Patterson, president of The Buckeye Pipe Line Company.



The capsule containing congratulatory messages is attached to a Magnolia Pipe Line scraper in Texas.

ETC 28141



Lyle D. Sampson and Philip R. Snow of National Transit Company removing the microfilmed letters after a month's journey. With them, standing, are R. L. Lockwood, president of National Transit; George S. Patterson, Buckeye Pipe Line president and chairman of Oil Centennial's message committee; Rosalie Samley, "Miss Pennsylvania"; J. Paul Jones, president, Pennsylvania Grade Crude Oil Association and Oil Centennial, Inc., board chairman; Robert C. Newell, executive secretary, Oil Centennial, Inc.; and Charles B. Stegner also of Oil Centennial, Inc.

"Who knows?" Mr. Patterson said, "The success of this method of sending messages may lead us to new uses for pipelines."

Transmission of the letters was arranged by a committee of Oil Centennial, Inc., of which Mr. Patterson was chairman. Oil Centennial, Inc. is a group of oilmen and others who planned and staged 100th anniversary ceremonies. Events reached a climax in Titusville, Pa., the oil industry's birthplace, on August 27, when formal presentation of the letters was made to Governor Lawrence.

The pipeline messages involved Magnolia Pipe Line Company, National Transit Company and the Interstate Oil Compact Commission, in addition to Buckeye Pipe Line and Oil Centennial, Inc.

Earl Foster, general counsel of the Interstate Oil Compact Commission in Oklahoma City, obtained the letters and forwarded them to Dallas, Texas. There, Magnolia Pipe Line recorded them on a roll of microfilm no larger than a lead pencil eraser.

The microfilm started its journey on May 5, when it was put in Magnolia's 20-inch crude oil line at Corsicana, Texas. It was in a special container attached to a go-devil, or scraper, a device passed through a pipeline intermittently, propelled by the flow of oil, to keep the line free of deposits.

Slowly and silently, across seven states, the message-bearing capsule traveled northeastward from Texas. At several points along the way, it was purposely delayed so that ceremonies and on-the-spot radio broadcasts could be conducted.

At Patoka, Ill., 650 miles and 10 days after starting, the message capsule was transferred for the first time—from Magnolia's 20-inch line to that company's 10-inch line. Then it was put in Buckeye's 8-inch line at Lima, Ohio. Later at Mantua, Ohio, it was switched to a 6-inch Buckeye Line.

From Grove City, Pa., where National Transit took over, the capsule moved into Titusville via first a 6-inch and then a 4-inch line.

Greetings Arrive

With the transfers from one line to another and with planned delays en route, the governors' greetings reached Titusville on June 4. At 12:12 that afternoon, a National Transit employee plunged his pipeline hook into the neck of the receiving unit at his company's pump station and pulled out the scraper, with its gubernatorial letters.

It was especially fitting that Titusville was the destination of the messages and that they and one of the scrapers used are to be placed on exhibit at the Drake Museum there. Titusville is not only the birthplace of the petroleum industry; it was there also that pipelines originated 94 years ago.

In completing its month-long, Texas-to-Pennsylvania trip, the small message capsule did more than chalk up a notable "first." It focused public attention on the efficiency, reliability and economic importance of the extensive network of pipelines which transports crude oil and petroleum products throughout the country. #

WORKING FOR PI

In supplying a variety of chemical additives, Ethyl plays a key role in improving petrole

RIGHT FROM ITS START, as the centennial slogan says, the petroleum industry has been "working for progress." It's no secret, however, that more of this progress has come in recent decades than in the pioneering era touched off by the Drake discovery well.

In the field of fuels and lubricants alone, the giant strides of the last third of a century or so have helped double and redouble the scope and performance of motorized transportation, power farming and aviation.

Ethyl Corporation, which observed the 35th anniversary of its incorporation on August 18—just 9 days before the oil industry's 100th birthday—has been a partner in the astounding progress of petroleum's more recent years. In developing and supplying vital antiknock compounds and other additives for gasoline and related petroleum products, Ethyl has played a key role in the continuous improvement of fuels and lubricants.

Chemical Wonder Workers

Antiknock compounds, the principal gasoline additives, illustrate the growing use and importance of these chemical wonder workers over the past 35 years.

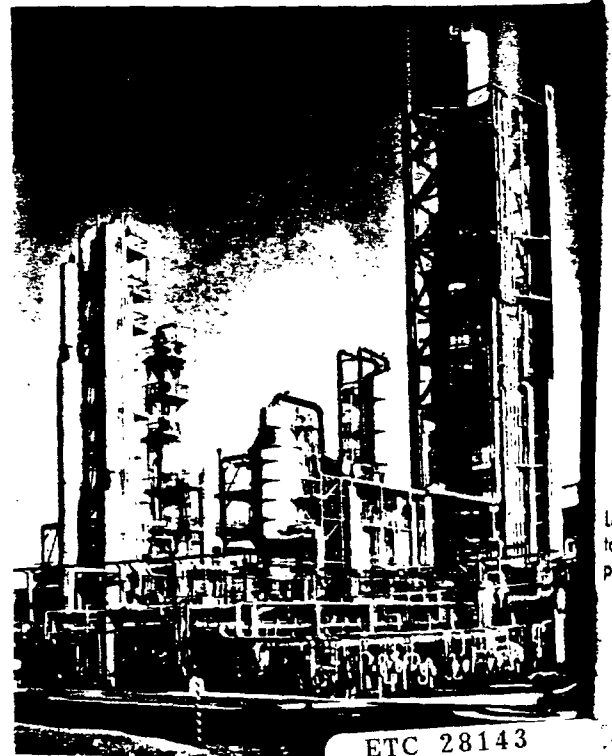
Back in the 1920's, when Ethyl Corporation first marketed antiknock compounds, they were used only in premium fuels, which then accounted for less than 10 percent of total gasoline sales. Today, they are used in about 98 percent of all motor and aviation gasolines produced in the United States.

In the early days of antiknock compounds, regular and premium gasolines ran about 55 and 71 octane numbers (Research), respectively. Today the corresponding averages are 92 and 99.1. The

tetraethyl lead in antiknock agents adds, on the average, about nine octane numbers to the nation's gasolines.

The widespread use of gasoline antiknock additives makes substantial economic contributions to both the motoring public and the oil industry.

By increasing the octane number of gasolines, the compounds help automobile engines get maximum power and mileage and therefore make it possible for the motorist to obtain more efficient gasoline at low cost. At the same time, they help the oil industry meet automobile engine octane requirements economically, increase the flexibility of refinery operations, and enable refiners to space acquisitions of new processing facilities to best advantage.



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PROGRESS

19 Petroleum products

Furthermore, the use of TEL conserves between seven and eight billion gallons of gasoline a year. This is the additional amount of gasoline, it is estimated, that would be required to meet the needs of the motoring public, if the antiknock quality provided by tetraethyl lead were not available.

Manganese Additive

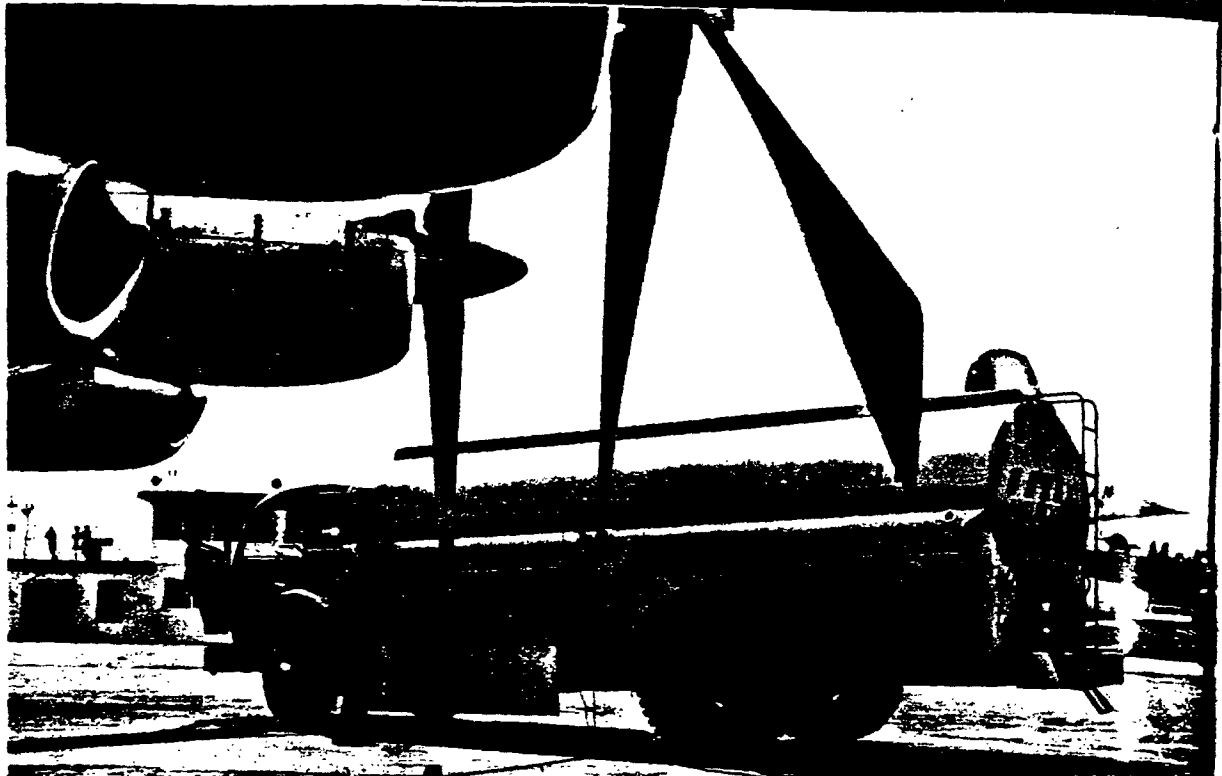
A recent development in the gasoline additive field, and one that has attracted a great deal of interest, has been the advent of supplements or promoters of tetraethyl lead. Such new compounds, though still in the development stage, are significant, since they extend the potential future usefulness of chemical antiknock agents.

Within the last few years, the Ethyl research laboratories have developed a highly effective antiknock chemical based on manganese. The compound is described chemically as methylcyclopentadienyl manganese tricarbonyl. A clear liquid considerably heavier than water, it is expected to prove valuable in supplementing and increasing the antiknock effect of TEL.

At present, the manganese compound is being evaluated by oil refiners in the United States and abroad. If present plans mature, it will extend the role of chemical antiknock agents, will enable refiners to produce high octane gasolines with a minimum of expensive investments in octane improvement facilities, and will further aid in the conservation of oil resources.

Left, refiners use "Ethyl" antiknock compounds to increase gasoline octanes economically . . . Right, a promising role for some of the Company's chemical additives is in fuels for powering rockets and missiles.





In aviation, Ethyl additives help improve the performance of gasoline, jet fuels, and lubricating oils and greases.

But the changing requirements of the world's automobile population and present-day driving patterns and car use have increased the demands on petroleum products beyond those associated with antiknock performance.

Ethyl additives play a big part in helping meet these demands. For while continuing its research and development work on gasoline antiknock compounds and other additives, the Company also makes and markets three ignition control compounds, Multi-Purpose Additive and eight antioxidants, with others in development stages.

Combat Dual Problems

The ignition control compounds help combat the dual problems of preignition and spark plug fouling which occur in some late model cars. Preignition takes place when the incoming fuel charge is fired prematurely by incandescent deposits in the combustion chamber. By chemically modifying the nature of such deposits, Ethyl's phosphorous-based additives restore normal combustion.

They also are effective in treating "rumble," a related problem of abnormal combustion that is noticeable as a low-pitched thudding sound.

It is generally believed that ignition control addi-

tives will find increasing use in high compression engines. With this in mind, Ethyl is carrying on research programs looking for still more and better phosphorous compounds. A number of these look interesting. One in particular offers much promise for the near future.

In meeting other problems of modern driving, "Ethyl" Multi-Purpose Additive is being used effectively. It eliminates carburetor and fuel system deposits and prevents carburetor icing, so that better engine performance is assured.

The additive's corrosion inhibiting action also protects service station pumps, lines and fixtures, as well as long distance pipelines, valves and large storage tanks.

Ethyl's antioxidants are an outgrowth of a novel chemical reaction discovered by the Company's research chemists. These agents are being used by a widening circle of refiners in fuels and lubricants and are also finding new applications in the food, rubber, plastics and related industries.

The antioxidants stabilize and preserve desirable properties of petroleum and other products. They are being employed with increasing success, among other places, in jet fuels and lubricants, in automotive and aviation gasolines, in crankcase oils and

transmission fluids, in diesel engine lubricants, circulating systems and in industrial oil and greases.

It is anticipated that these products will play an even more vital role in the future as fuels and lubricants are called on to perform with increasing efficiency under even more critical conditions.

Uses in Aviation

In the fast-moving field of aviation, Ethyl's new antioxidants are finding uses in gasoline, jet fuels and lubricants. At the same time, the Company's aviation mix antiknock compound continues to add valuable octane numbers to gasoline.

Ethyl also markets normal propyl nitrate and a mixture of ethyl nitrate and propyl nitrate. They are used in auxiliary power units in aircraft and may be used in rockets. These compounds—called monopropellants—contain a large part of the oxygen needed for combustion.

Additionally, Ethyl has a broad background in organometallic compounds and metal hydrides. Many of these compounds which the Company has synthesized have interesting possibilities as additives for liquid fuels and solid propellants.

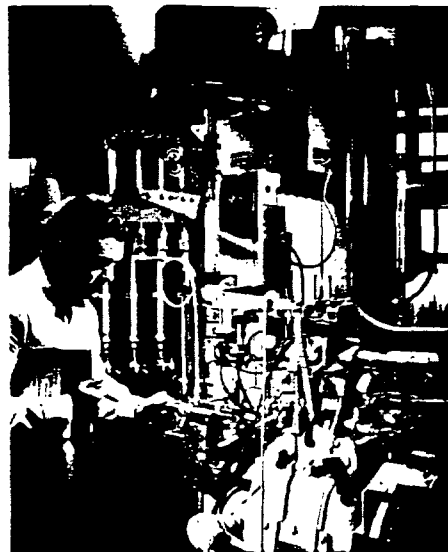
From the experience of the past and prospects ahead, it is clear that additives in use today and others yet to be developed will play an increasingly important role in the improvement of fuels and lubricants during oil's second century.

As the world's leading source for antiknock compounds and an important supplier of other additives for many of the petroleum industry's other products, Ethyl Corporation will be a major contributor to future progress. #

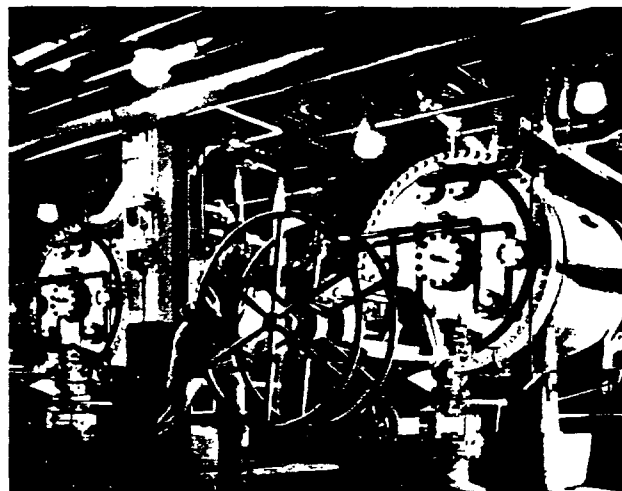
More About Ethyl Products

As a leading manufacturer and marketer of antiknock compounds for gasoline and other additives for petroleum fuels and lubricants, Ethyl Corporation works closely with oil refiners interested in possible applications for these products. In this connection, the Company provides samples of its various additives, literature explaining their handling and use, and the services of experienced technical personnel thoroughly familiar with them. Further information about all "Ethyl" products is available at Ethyl Corporation offices throughout the country.

—The Editors



Studies to develop better processes and new products are underway continuously in the Corporation's research laboratories.



Above, batteries of autoclaves like this are needed in manufacturing TEL, the active ingredient in "Ethyl" antiknock compounds . . . Below, motor vehicles everywhere operate with greater efficiency and economy because of these compounds and other additives.

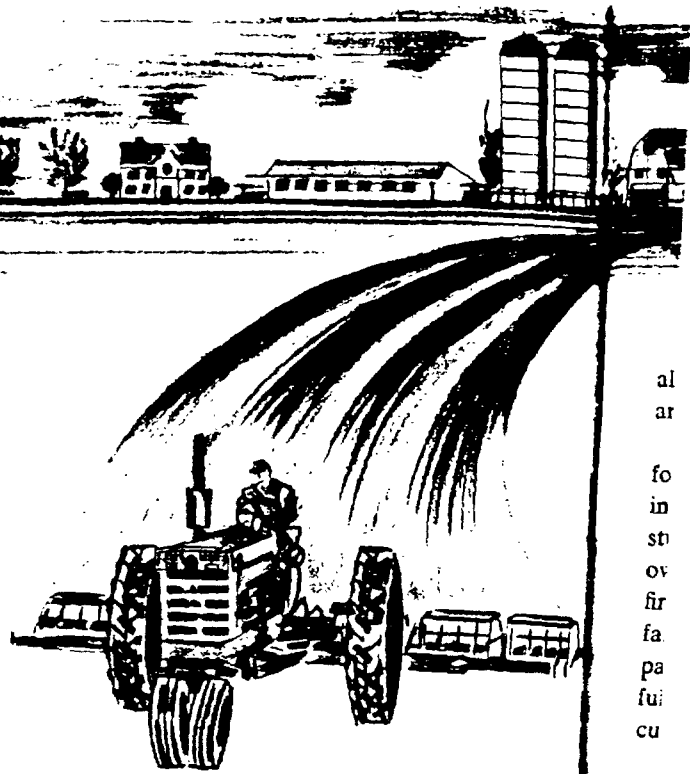


ETC 28146

Which Tractor—

GASOLINE DIESEL or LPG?

How this question is answered can
vitaly affect the economy of
operations on the modern farm



By K. L. Pfundstein*

Manager, Agricultural Engineering, Technical Service
Division, Research and Development Department,
Ethyl Corporation

IT'S JUST AS TRUE on the farm as it is in the manufacturing plant or in the retail sales establishment: you must have efficient operations to keep costs down and make a reasonable profit.

As he comes to realize this more and more, today's commercial farmer is taking a closer look at all of his operations. In the barnyard, out in the field, and at his desk, he is seeking to assure the success of his agricultural efforts by applying sound economics.

Since the purchase, ownership, operation, fueling and maintenance of mechanized equipment represent an important part of farm costs, farmers are particularly interested in determining the most efficient and economical type of equipment for their particular uses. In many cases, they are turning to petroleum marketers and farm equipment dealers for help in making a sound decision.

While this is true today, it will be even more true in the future. The number of American farms is declining, but the size of each remaining one is increasing and they are being operated more efficiently. This means that they will represent a larger and

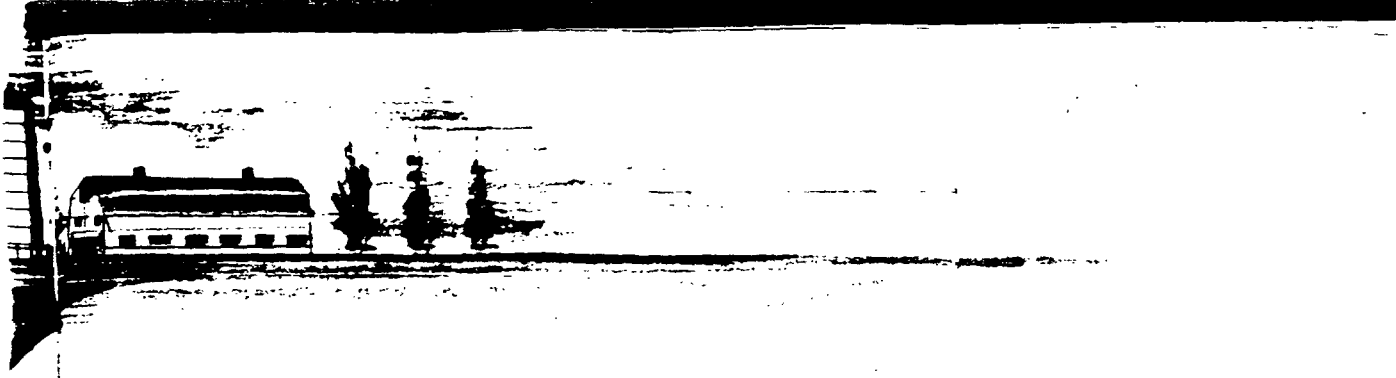
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also a more competitive market for farm tractors and petroleum products.

Because of its continuing interest in the performance of agricultural equipment and in the oil industry's farm market, Ethyl Corporation has studied the present and future economics of tractor ownership and operation carefully. The Company's findings are being made available to the oil and farm machinery industries to assist them in anticipating farm market demands and in providing helpful information which dealers can pass on to farmer-customers.

A farmer's choice of a tractor or power plant should properly be a matter of good farm management and planning. Before making a final decision, he should consider fuel type, horsepower, suitability for his uses, and consumption and cost of fuel required. He also should evaluate initial cost, depreciation, taxes, insurance, interest, service and maintenance, lubrication, years to trade-in, and hours of use per year. Because so many factors are involved, this has not been an easy thing to do.

Gasoline Most Popular

Gasoline-powered tractors are far and away the most widely used, with gasoline accounting for over 80 percent of the farm tractor fuel market. The number of diesel units has increased, however, and more tractors operated by LPG (liquefied petroleum gas) are in use in certain areas. Distillate burners, which were predominant 20 years ago, have nearly disappeared.

Continuing improvements in gasolines and gasoline tractor engines and their overall economic attractiveness, however, assure the continued predominance of such units.

A recent survey of tractors according to fuel type shows that gasoline and diesel powered models gen-

erally surpass LPG units in fuel economy. LPG is used mainly in the South and Southwest, where the proximity of refineries and natural gas plants makes the price of the fuel attractive.

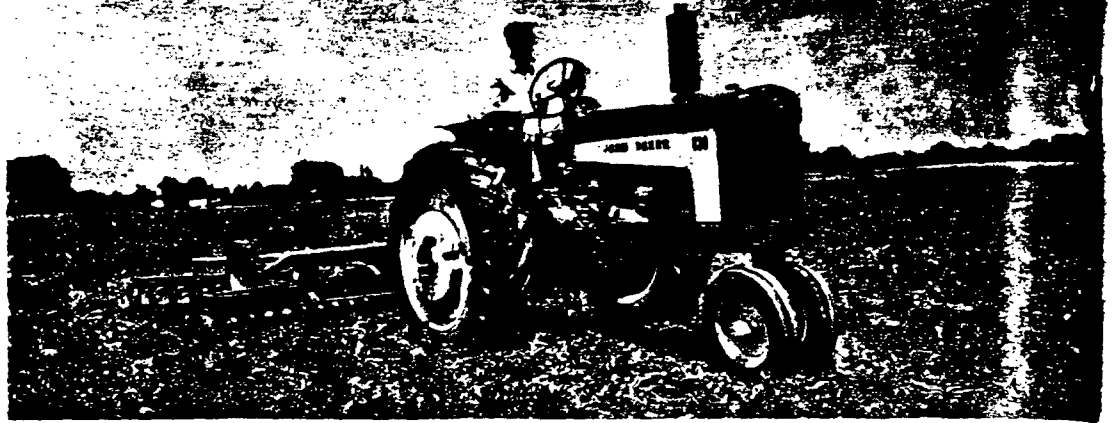
The popularity of the diesel is based on a traditional reputation for power, efficiency and durability, plus the tangible advantages of fuel economy and the lower price of diesel fuel.

Representative diesel fuel prices generally range from two to four cents a gallon less than prices for regular grade gasoline. This takes into consideration the federal bill passed in 1956 which provides for the refund of the federal tax when gasoline is used in farm tractors and other farm power plants. LPG prices vary extensively. In some parts of the south, they may be as much as 10 or 11 cents a gallon less than gasoline.

But in applying sound farm economics to tractor purchases and operations, the farmer must relate



Selection of the proper type of tractor is part of the sound economics that today's commercial farmer is applying to all of his operations.



The steadily improving performance of gasoline-powered tractors, achieved notably by raising compression ratios to take advantage of fuel quality, is one big reason for their popularity.

fuel costs to overall tractor costs—especially to hours of tractor use.

Recent years have seen a progressive decline in hours of individual tractor operation. This trend results from the use of more tractors per acre, from an increase in the work capacity per unit, and from the use of more self-propelled farm machinery. Currently, average tractor use is down to the neighborhood of 650 to 700 hours a year.

Must Operate More

Relating this fact to total tractor costs, it is found that diesel tractor owners—despite the advantage in the price of diesel fuel—must operate their units at least twice this average 650-700 hours a year to justify higher initial and other-than-fuel costs. LPG tractor owners—even in a situation where their fuel is as much as six cents a gallon under gasoline—must operate their units more than twice the national average to justify higher purchase prices.

The present and future popularity of the gasoline tractor is related, among other things, to its smaller price tag. Important in itself, the lower initial cost also makes possible a more rapid amortization and reduces related expenses for insurance, interest, taxes and depreciation.

Further, the steadily improving performance of gasoline tractor engines adds to their attractiveness. This better performance has been achieved notably by raising compression ratios to take advantage of higher quality gasolines.

In looking to the future, Ethyl Corporation is co-operating with leading tractor manufacturers in evaluating compression ratios as high as 12 to 1. These studies indicate that more gains in gasoline

tractor power and economy — without adverse effects on engine durability—will be forthcoming through higher compression ratios.

In addition to compression ratio, a common measure of engine performance, the power developed per cubic inch of engine displacement is a critical factor. When compared at the same engine speed, gasoline tractor horsepower per cubic inch of displacement closely approaches that of current passenger cars. It exceeds the performance of diesel tractors by some 15 percent. Such high-output engines in today's gasoline powered tractors rely heavily on the high quality and rigid specification of modern fuels and lubricants.

All types of tractor engines, of course, are being



Trends in the use of tractors by fuel type is of real interest to refiners and marketers of petroleum products.

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improved continually. As in passenger car engines, considerable attention has been given to reducing engine friction through greater structural rigidity and more precise manufacturing. Such things as improved engine breathing and improved combustion chamber design have provided greater returns from fuels. Overhead-valve engines have almost completely supplanted previous L-head designs, primarily because of their potential for better performance.

Engine durability has been increased markedly by such advancements as better design and placement of air cleaners, thermostatically-controlled pressure cooling, improvements in combustion chamber design, the adoption of full-flow oil filters, the widespread use of exhaust valves rotators and the introduction of chrome-plated piston rings, as well as improved materials in other engine parts.

Big Gains Made

Tremendous gains have been scored in the productivity of American agriculture within recent years. Today, a sharply reduced number of American farmers is supplying the needs of 176 million people—42 percent more than in 1930—from fewer farm acres. As a matter of fact, a cultivated acre today provides food and fiber for 50 percent more people than it did less than 30 years ago.

What's responsible for such sweeping agricultural progress?

The answer, of course, is that many things have

contributed. One of the most important has been reliable farm tractors and machinery operated by large quantities of high quality petroleum products. Today, for example, farmers spend more than \$2½ billion for fuels and lubricants annually—an amount equal to their total yearly purchases of all kinds of farm machinery and equipment.

As he plans for the future, the American farmer will continue to rely heavily on the tractor. The economic suitability of different fuel types will be even more important to him as he strives to increase further the economic efficiency of his operations. #

Booklet On Tractors

To provide helpful information to petroleum marketers and farm tractor manufacturers and dealers so that they in turn, can help the individual farmer select the type of tractor that is most economical for his operations, Ethyl Corporation has published a booklet entitled "Economics of Tractor Operation." Based on Ethyl studies, this booklet contains tables that show which type of tractor—gasoline, diesel or LPG (liquefied petroleum gas)—is the most practical for particular farm situations. Copies of the booklet are available through the Company's regional offices in New York, Chicago, Tulsa and Los Angeles, or may be obtained by writing Ethyl Corporation, 100 Park Avenue, New York 17, New York.



Much of the bounty of today's American dinner table can be traced to tractor efficiency which enables fewer farmers to produce larger crops on less acreage.



Oscar B. Lewis



Donald L. Jennings

Oscar B. Lewis Retires as Vice President; Donald L. Jennings Appointed Comptroller

OSCAR B. LEWIS, vice president of Ethyl Corporation of Canada Limited, has retired after serving Ethyl in the United States and Canada for 32 years. Some of his former duties are now being handled by Donald L. Jennings, who was appointed comptroller and administrative assistant of the Canadian company on July 1.

Mr. Lewis joined Ethyl in 1927 and subsequently represented the Company in New England, the Midwest and Great Britain. He was made manager of the Baltimore division in 1930. After establishing Ethyl's safety department and managing it for 12 years, Mr. Lewis was appointed assistant general sales manager in 1947. After that time, he served as general manager of the Company's Canadian affiliate and as vice president of Ethyl of Canada for eight years.

In his new finance post, Mr. Jennings succeeds James P. Moran, who is returning to Ethyl Corporation in New York City after serving three years as comptroller of the Canadian company. Mr. Jennings holds a degree in business administration from Indiana University and has done graduate work at New York University, Detroit Institute of Technology and the University of Michigan. He joined Ethyl Corporation in 1942.

Formulas Speed Prediction of Gasoline Octane Numbers

GASOLINE REFINERS can save time and money in predicting the octane numbers of gasoline blends if they use new formulas developed in the research laboratories of Ethyl Corporation.

The Company's formulas simplify and expedite what can be a long and tedious procedure. They have been checked for reliability and accuracy on 135 different gasoline blends, each containing from two to 15 fuel components.

Ethyl Methods Contribute to Phosphorous Measurement

AS OILMEN ADD phosphorous compounds to more gasolines to combat preignition and spark plug fouling (See *Working for Progress*, page 14), speedy and accurate determination of phosphorous concentrations is becoming increasingly important.

Ethyl has developed two new analytical methods—spectrographic and colorimetric—which are expected to help refiners with their phosphorous measuring procedures.

Airline Helps Evaluate Antioxidant's Effectiveness

THE EFFECTIVENESS of "Ethyl" Antioxidant 733 in aviation gasoline is being evaluated for Ethyl Corporation by Trans World Airlines. Full-scale tests at the airline's maintenance headquarters in Kansas City, Kans., involve the operation of a large aircraft engine for 150 hours on aviation gasoline into which "Ethyl" 733 was blended.

Favorable results anticipated from this midsummer project could lead to an expanding market for the stabilizing additive. It is one of eight similar products now available from Ethyl for use in automotive and aviation fuels, lubricating oils and greases, transmission fluids, rubber and plastics and in the food industry.

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New Stars for Old Glory

**Changes in the design of the
flag reflect the continuing
growth of our country**

Add two more stars to the flag? Never! Why eventually there might be as many as 20 states in the Union. Certainly no one would want to crowd that many stars on the blue field.

Those of our founding fathers who argued thus against putting stars on the flag for the new states of Vermont and Kentucky 166 years ago would be amazed at the appearance of the flag today—with its recently-added star for Alaska and plans underway for another, for Hawaii next year.

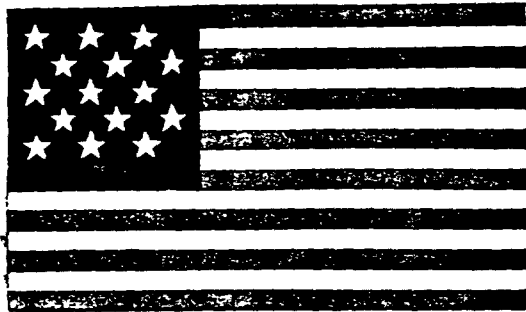
But the rule has long since been "a star for every state, and a state for every star," so when Congress voted the 49th and 50th states into the Union it automatically voted two new stars for Old Glory.

It is a matter of history that the flag has changed many times since the original design of 13 red and white stripes and 13 white stars on a field of blue was approved by the Continental Congress in 1777. The flag, as President Wilson pointed out in proclaiming the first Flag Day in 1915, is "the embodiment of our history."

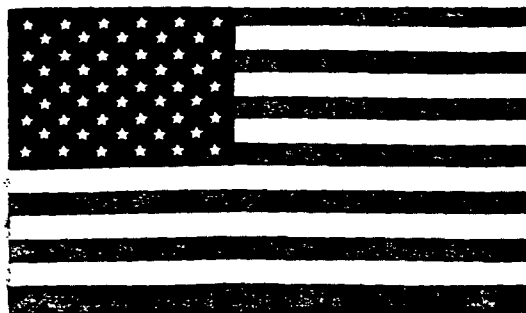
Back in 1793 there was no precedent for adding more stars to the national ensign. After all, the fledgling country had never been faced with the problem before. George Washington had been president for only four years, and Vermont and Kentucky were the first two states to join with the original 13.

As things turned out, the two stars were added in spite of the objections—and also two stripes. For the next 23 years Americans pledged allegiance to a flag of 15 red and white stripes and 15 stars. It was this "Star Spangled Banner" flying over Fort McHenry that inspired Francis Scott Key to write our national anthem.

But stripes and stars couldn't be added indefinitely—not at the rate the United States was growing. So in 1818, when already there were 20 states in



Above, the 15-star and 15-stripe ensign of the War of 1812, when Francis Scott Key wrote our national anthem. Below, this is how 50 stars will be grouped in the flag's field on July 4 next year.



the Union, Congress decreed that thereafter the flag of the United States would contain no more than 13 alternate red and white stripes, symbolizing the 13 original states, and that the blue field would have 20 stars. The law further stipulated that whenever a new state was admitted, a new star would be added on the July Fourth after admission.

Following this Congressional action, almost a full century passed before further official action was taken on the flag—except to add stars. By 1912, when the admission to statehood of Arizona and New Mexico brought the number of stars to 48, U. S. flags of some 66 different sizes and shapes were in use.

When these variations were brought to the attention of President Taft, he issued an order establishing definite proportions for the flag. Those proportions remain the standard today. They fix the length of the flag, no matter what its size, as one and nine-tenths times the width. Other specifications prescribed the proportions of the blue field, the width of the stripes and the diameter of the stars.

For all the specifics of President Taft's order and a national flag code adopted in 1942, there never has been any official designation for the pattern of the stars on the blue field. At one time they formed a single large star. With that exception and the original circular arrangement, they have usually been arranged in horizontal rows.

Many New Designs

Over the years, particularly in anticipation of statehood for Alaska and Hawaii, patriotic Americans deluged government offices and the nation's flag makers with proposed new designs. One person suggested that the stars be arranged to form one large circle, and that the world polar map, symbol of the United Nations, be placed in its center. This, he said, would be a "glowing demonstration that our country recognizes a permanent connection with the world community."

Most of the suggestions, however, were less revolutionary. They dealt with the number of rows of stars and the number of stars in each.

Actually, the final decision for the star arrangement rests with a special committee appointed by the President. This committee selected a pattern of seven staggered rows of seven stars each for the new flag unveiled this July 4. Late in August, when President Eisenhower proclaimed statehood for Hawaii, he made public the approved design for a 50-star flag to become official on July 4 of next year. It has five rows of six stars each, interspersed by four rows of five stars.

No matter how the stars are arranged, they symbolize the westward expansion of our borders. And they give even more significance to a statement by a member of the committee of the Continental Congress charged with designing a flag for the young republic. More than 180 years ago, this unidentified delegate declared that the stars represent a "new constellation of states rising in the West." #

I AM OLD GLORY. For more than nine score years I have been the banner of hope and freedom for generation after generation of Americans. Born amid the first flames of America's fight for freedom, I am the symbol of a country that has grown from a little group of 13 colonies to a united nation of 50 sovereign states. Planted firmly on the high pinnacle of American faith, my gently fluttering folds have proved an inspiration to untold millions. Men have followed me into battle with unwavering courage. They have looked upon me as a symbol of national unity. They have prayed that they and their fellow citizens might continue to enjoy the life, liberty and pursuit of happiness, which have been granted to every American as the heritage of free men. So long as men love liberty more than life itself; so long as they treasure the priceless privileges bought with the blood of our forefathers; so long as the principles of truth, justice and charity for all remain deeply rooted in human hearts, I shall continue to be the enduring banner of the United States of America. I AM OLD GLORY.

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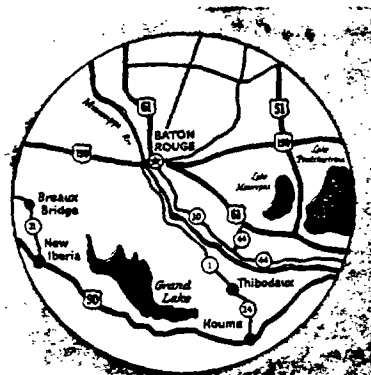
Make new friends by car. A map is the only passport you need to meet people every bit as colorful as the Cajun country people. Your car gives you a leisurely chance to enjoy their company, share their customs.

Your car makes any map a Magic Circle



This Bayou Magic Circle is full of free-wheeling, high-spirited fun along any road you drive. Wherever you live, you have a Magic Circle like it all about you. Plan to explore it, enjoy it, soon.

This series of advertisements is published by Ethyl Corporation, New York 17, N. Y. to help you get more enjoyment out of your car. Ethyl Corporation manufactures antiknock compounds, used by oil companies everywhere to improve their gasolines and your driving pleasure.



*Take a pencil and map out
your Magic Circle. Your car
is the best investment in fun
you ever made. Don't miss out
on its endless happy returns.
Start driving - start really
living - next chance
you get.*



Dine out gourmet-style. At Breau Bridge, the specialty is Crawfish Etouffée. In your Magic Circle, an easy drive will take you to scores of fine dining places, delicious dishes. What's *your* pleasure?



Watch the scenery go by. You'll discover sights like these river-bank mansions, majestic as Ole Man River himself, right outside your car window . . . right along the fine roads in *your* Magic Circle.



Visit the landmarks. The grandeur of Louisiana's capitol is worth the trip. (So's the view.) You can match this attraction with many in your own Magic Circle. Make a date with *your* car and see.

ETHYL NEWS

SEPTEMBER-OCTOBER 1959



ETC 28156

ETHYL NEWS

SEPTEMBER-OCTOBER 1959



THE COVER shows that looking for oil in Alaska is indeed a "Big Search in the Great Country," as the article with that title points out on pages 8-11. By land, sea and air, oilmen are pushing the costly exploration that already has cost far more than the \$7 million we paid Russia for what is now the 49th state, almost a century ago.

1859
1959
OIL'S FIRST CENTURY
-BORN IN FREEDOM
WORKING FOR PROGRESS

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CREDITS:

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ETHYL NEWS is published by

Ethyl Corporation, 100 Park Avenue, New York 17, N. Y. manufacturer of "Ethyl" antiknock compounds, used by oil companies to improve the antiknock quality of motor and aviation gasoline.

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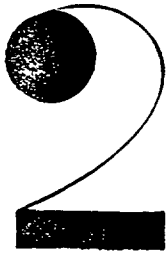
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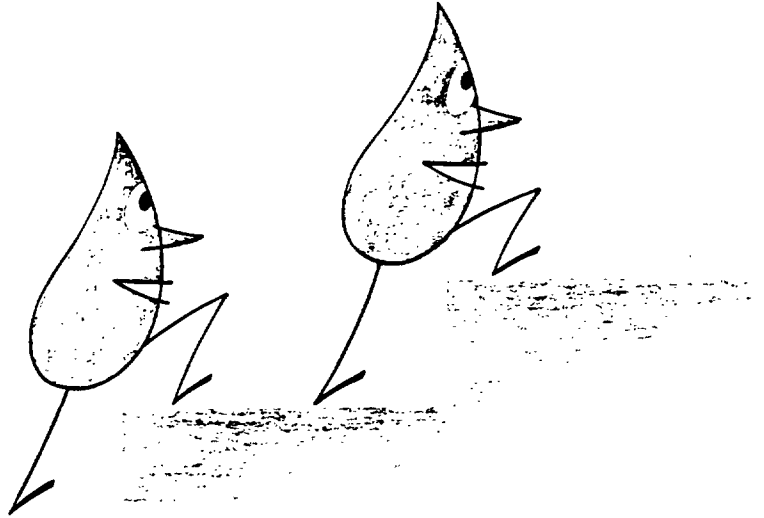
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STEPS TO THE TOP

**Ethyl's new Motor 33 Mix and
higher concentrations of TEL
help refiners produce octane
numbers more economically**



TWO SIGNIFICANT ADVANCES in the use of antiknock compounds that will help oil refiners produce the important top octane numbers in automotive gasoline more economically, and at the same time improve refinery flexibility, have been scored recently. The first is related to the use of increased amounts of tetraethyl lead, the antiknock agent now used in 98 out of every 100 gallons of gasoline. The second involves the use of a new additive made possible by a research breakthrough achieved in Ethyl Corporation laboratories.

Greater use of tetraethyl lead became available to refiners when they were notified by TEL manufacturers in the United States of an increase in the maximum permissible concentrations of tetraethyl lead

in automotive gasoline from 3 to 4 cc. per gallon.

The second advance followed closely on the heels of the first. It came in the form of a new antiknock compound for motor gasoline developed by Ethyl and now available to refiners in commercial quantities. The product, "Ethyl" Antiknock Compound—TEL—Motor 33 Mix, combines lead and manganese to form the most effective antiknock compound to be marketed in over 35 years.

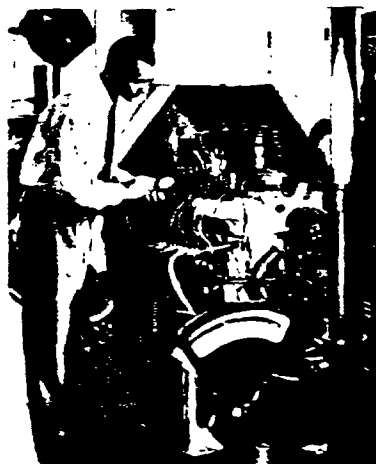
Both new advances in the use of antiknock compounds are important to refiners. They can help increase gasoline yields per barrel of crude oil, permit greater flexibility in current operations, and enable refiners to defer or eliminate expensive capital investments in octane improvement facilities.

**The use and effectiveness of Motor 33 Mix and of higher
TEL concentrations are described on the following pages**

Higher Concentrations of TEL



Use of Motor 33 Mix and higher TEL concentrations help conserve stocks of crude oil by increasing gasoline yields.



In Ethyl research laboratories—and on the road, too—4 cc. of TEL and motor 33 Mix have been thoroughly tested.

THE RECENT INCREASE in maximum permissible concentrations of tetraethyl lead, from 3 to 4 cc. per gallon of motor gasoline, gives refiners greater flexibility and economy in meeting the gasoline requirements of the motoring public.

The previous upper limit of 3 cc. per gallon was established in 1926, following a study by a committee appointed by the Surgeon General of the United States Public Health Service. Since that time, TEL has come to be used much more widely, as succeeding price reductions have increased its economic attractiveness.

Economic Advantages

The suggestion that a higher limit be considered was made because experience has shown that the availability of increased concentrations would provide even greater economic advantages for refiners in their manufacturing operations. At the same time, available evidence indicated that no threat to the public health would arise out of such a change.

In accordance with precedent and policy, the advice of the Surgeon General of the United States Public Health Service was sought. A special committee was appointed by the Surgeon General to review the facts. This committee, after a thorough study of the subject, concluded that the proposed change "would not increase the hazards involved in the manufacture and distribution of leaded gasoline." It also stated that available data "do not indicate that such change would significantly increase the hazard to public health from air pollution."

Following receipt of the committee's report, tetraethyl lead manufacturers notified oil refiners that they would thereafter permit the use of up to 4 cc. of TEL per gallon of motor gasoline.

The levels of concentration of TEL in motor gasolines in the United States in September 1959 averaged 2.47 cc. per gallon of premium and 1.84 cc. per gallon of regular. Thus the maximum concentration of 3 cc. per gallon had not been reached on an average nationwide basis.

The change in the maximum concentration of TEL in motor gasoline—the maximum of 3 cc. per gallon had remained unchanged for 33 years—is not expected to effect any marked alteration of the average national concentration for some time. Rather, it is expected that there will be gradual increases in the future as in the past as oil refiners use higher available concentrations.

Savings Made Possible

Beside helping refiners produce high quality gasolines simply and economically, the higher concentrations will make possible substantial savings in the capital investments which would otherwise be required to install octane improvement processes and equipment. They will further aid in the conservation of oil resources.

Added to the octane gains presently achieved with 3 cc. of TEL, the fourth cc. will give gasoline another 1 to 2 octane numbers. In one recent study of 30 commercial premium gasolines it was found that.

(Continued on page 4, column 1)

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Motor 33 Mix

"ETHYL" ANTIKNOCK COMPOUND—TEL—Motor 33 Mix is a superior antiknock compound that substantially increases the economic usefulness of tetraethyl lead to refiners and to the motoring public. It is one of the most significant advances in the technology and importance of antiknock additives since the introduction of TEL in the early 1920's.

In fuels where Motor 33 Mix has good response, it provides octane numbers at a lower cost than is available either from TEL alone or from refinery processes. Moreover, it contributes to higher gasoline yields through better utilization of various refinery streams. It also makes possible gasolines of better road performance than at present.

The new compound consists essentially of a mixture of tetraethyl lead and methylcyclopentadienyl manganese tricarbonyl. It is the result of intensive research work by Ethyl Corporation laboratories on potential new antiknocks and of important discoveries in the field of organometallics (see pages 14-17).

Exhaustive Tests

A few years ago, the Ethyl laboratories found that small amounts of certain organic compounds of manganese had a unique effect in promoting the antiknock action of tetraethyl lead. One of the most promising of these compounds was methylcyclopentadienyl manganese tricarbonyl, which for convenience was labelled AK-33X. Accordingly, AK-33X was subjected to exhaustive road and laboratory tests as a sup-

plement to tetraethyl lead.

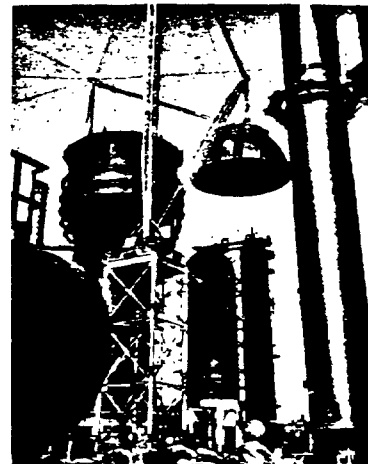
During the last year, 31 refiners in the United States and abroad have tested the new antiknock formulation of lead and manganese in their gasolines. Over 125 million gallons of gasoline so treated were used by the public, with highly satisfactory results. Previously, the new antiknock had been subjected to over 100,000 hours of dynamometer testing in the Ethyl laboratories, was tested in over 7 million vehicle-miles in automotive test fleets, and was further tested in another 1½ million miles of driving by Ethyl Corporation personnel.

Greatest Effectiveness

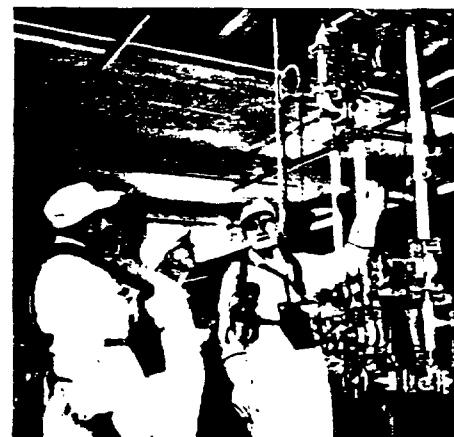
As a supplement to tetraethyl lead, the manganese compound was found to have the greatest effectiveness in those hydrocarbons and gasolines in which TEL shows good effect. It is most effective in alkylates and paraffinic naphthas, moderately effective in olefins, and least effective in aromatics. Furthermore, tests showed that the greatest "promoter" benefits of the manganese compound occurred at higher concentrations of tetraethyl lead.

In the new antiknock compound, TEL and the manganese compound are combined in a proportion of 0.05 grams of manganese for each cc. of tetraethyl lead. The inclusion of manganese adds as many as 3 more octane numbers to the more responsive gasolines at the 3 cc. TEL level. Moreover, Motor 33 Mix can supply these additional octane numbers at a cost that can be

(Continued on page 4, column 2)



Both new advances enable refiners to defer or eliminate construction of costly octane improvement facilities.



Motor 33 Mix can be handled in the same tetraethyl lead mixing plants already installed at refineries.

Higher Concentrations of TEL

(Continued from page 2)

in terms of Research octane number, it added 0.8 octane number on the average and 1.4 at the maximum. In terms of Motor octane number, the average increase was 1.0 and the maximum 2.1. The average gain in road octane numbers was 1.1, and the maximum in this category was 1.9.

Extensive tests by Ethyl Corporation have shown that gasolines containing 4 cc. of tetraethyl lead have no overall adverse effect on automobile engine performance. These tests included four million miles of testing in all types of vehicles, 12,000 hours of tests in farm tractors, and 2,000 hours of laboratory engine testing.

Gasoline containing 4 cc. of TEL did not affect valve life adversely, did not affect engine cleanliness, and had no significant effect on oil oxidation or bearing corrosion with high quality oils. Further, it did not markedly alter the octane requirement increase of engines or their tendency toward surface ignition.

Committee's Recommendations

In its report, the committee appointed by the Surgeon General recommended that the oil industry proceed cautiously in increasing lead concentrations in gasoline so that there will be no large abrupt increase in any one year. It also suggested that the Public Health Service continue to study the matter of lead in the atmosphere and in the human body in collaboration with the TEL industry, the oil industry and others.

As the pioneer and leading producer and distributor of tetraethyl lead, Ethyl Corporation has, for more than 35 years, sponsored continuing research investigations into the effects of lead discharged in the atmosphere from automobiles.

The findings of these studies establish that: (1) many sources, other than automobiles operating on gasoline containing TEL, contribute to the total lead in the atmosphere; (2) the total amount of lead dispersed in the atmosphere from all sources—even in highly populated urban centers—is well below hazardous limits; and (3) the present increase in TEL concentrations will not add significantly to the total. #

Motor 33 Mix

(Continued from page 3)

as much as 50 percent less than the comparable cost of refinery processing.

At the same time, Motor 33 Mix permits many refiners to use less severe catalytic reforming—thereby increasing gasoline yields per barrel.

It also encourages greater use of natural gasoline or virgin light naphthas, and thus contributes to gasoline blends with improved road antiknock performance.

The new product can be handled in the same tetraethyl lead mixing plants already installed at refineries, without any change in equipment.

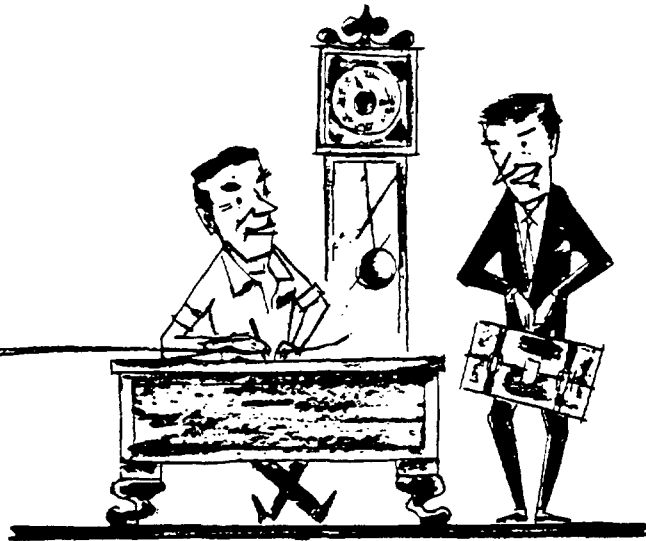
Eventually, it is believed, Motor 33 Mix will be widely used in premium and regular gasolines. #

"ETHYL" ANTIKNOCK COMPOUND-TEL
MOTOR 33 MIX
ETHYL CORPORATION

Tank car, tank truck and drum shipments of the new antiknock compound are specially marked with identifying labels.



The gasoline quality demands of the motoring public can be met with greater flexibility and economy on the part of refiners through the use of Motor 33 Mix and increased TEL concentrations.



By Frank L. Remington

Paving the Way for Roads

Acquiring the land on which
highways are to be built
is often a tougher job
than building them

“YOU ROBBER!”

The elderly, gray-haired woman rose angrily from her chair. “My house is not for sale at any price. Now get out of here, or I’ll get my gun!”

The neatly-dressed man from the state highway department scooped up his papers, grabbed his hat and ran for the door. Only a moment before, he had been quietly offering to buy the woman’s property which lay directly in the path of a proposed new freeway.

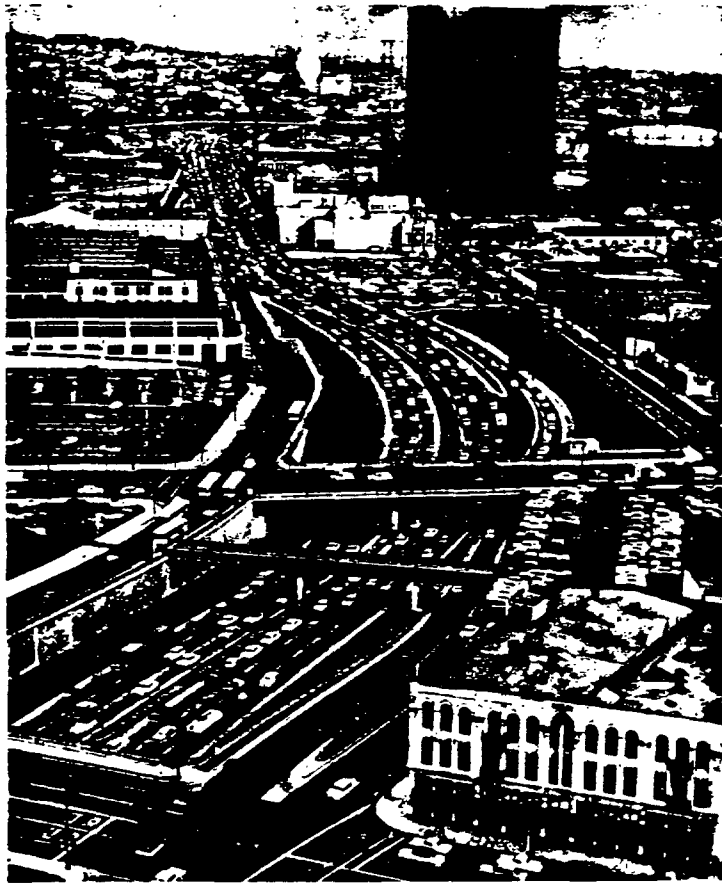
Threats of violence are rare, but they are one of many problems faced by land-acquisition agents—the men who assemble the real estate for the nation’s road and highway rights-of-way. Designing bridges, constructing road bases and surfacing highways call for lots of skilled work, but before the first bulldozer can move in, the land must be available.

Millions of Acres Needed

Since about 75 percent of the nation’s 41,000-mile interstate highway system will follow new routes, some two million acres of land must be purchased from private owners or secured by condemnation proceedings. Thousands of miles of state and local roads now on the drawing boards will require vast additional acreage. Together, they will call for acquisition of land, suppression of “freeway free-



Land acquisition and building removal costs are highest where rights-of-way pass through built-up areas.



booters," and settling issues that would tax the wisdom of Solomon.

Acquiring rights-of-way for a new road can consume months and even years of planning, negotiation and sometimes litigation. To clear the path for a Chicago freeway project, for example, it was necessary to transfer 700 graves to new locations, according to the wishes of the next of kin. It took more than a year to contact them.

How is most property acquired for public roads?

First, of course, the state offers to purchase it for a fair price—determined by an appraiser who knows how much the owner paid for it and its present value. When a price has been agreed on, the state pays the landowner in cash and in return secures deeds, title clearances and right-of-way contracts.

Only when negotiations bog down does the state seek court action. Experience in California shows that this is relatively unusual. In a recent year, that state's Right-of-Way Department secured 8,417 parcels of land by purchase and resorted to condemnation in only 267 cases. (California's Right-of-Way Department has been expanded into the largest such land acquisition agency in the country. Washington recently suggested it as a model for other states to follow in buying property for the federal highway program.)

Legal Action Taken

When no agreement can be reached, legal action is pursued under "eminent domain," an ancient legal principle provided for in most state constitutions. Lawyers define "eminent domain" as the superior right by which the government can take or control private property for the benefit of the public without regard for the wishes of the owner.

The Fifth Amendment to the Constitution further declares ". . . nor shall private property be taken for public use without just compensation."

So, whether he sells willingly or by court order, the land owner is fairly paid.

Because they are spent more or less behind the scenes, the dollars that go for land acquisition are not always fully appreciated. Sometimes, however, they are more numerous than those that go into construction costs, as in the case of the Los Angeles Harbor Freeway. Right-of-way payments there came to \$46 million, as compared to construction costs of \$29 million.

Costs run particularly high, of course, in urban

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areas where real estate is more valuable. For this reason, highway planners try to route new thoroughfares through older sections of the city and at the same time achieve slum clearance. Unfortunately, parks and desirable residential areas are often condemned too, sometimes with consequent furor. A case in point is Milwaukee, where one proposed route aroused adults and children too, when it not only threatened several fairways at two golf courses but also endangered the zoo.

Cities encounter problems, too, when it comes to industrial plants and commercial establishments. Some businesses cannot relocate nearby easily and threaten to move to other communities. To prevent this from happening and to keep displaced companies on their tax rolls, some cities make commercial property available at low cost.

Move Homes to New Locations

While it isn't often practical in the case of commercial or industrial buildings, many owners of private homes want to keep their dwellings after selling the land and move them to new locations. Usually, however, the state purchases the house and lot outright, either selling the building at public auction or demolishing it. Sometimes buildings sell for as little as \$1—the state thus saving the cost of tearing them down or moving them.

There are enterprising businessmen who regularly buy and sell condemned houses, even setting up lots where they can be displayed. In 1956, California received nearly \$4 million for auctioned buildings, plus another \$3 million in rentals from structures awaiting demolition or removal.

When apartment houses or large numbers of houses are torn down they create an additional problem—finding new living accommodations for the evictees. Some cities—Chicago, for example—have families chauffeured around at public expense to look for new homes.

And so it goes. For every mile of road that is built the real estate problems involved are many. But as they and construction problems are solved, they will contribute to a road network reaching into every corner of the country, linking 42 state capitals and 90 percent of all cities with a population of 50,000 or more. The new roads will help relieve traffic congestion and will help accommodate the millions of additional vehicles expected to roll over the nation's thoroughfares in the next few years. #



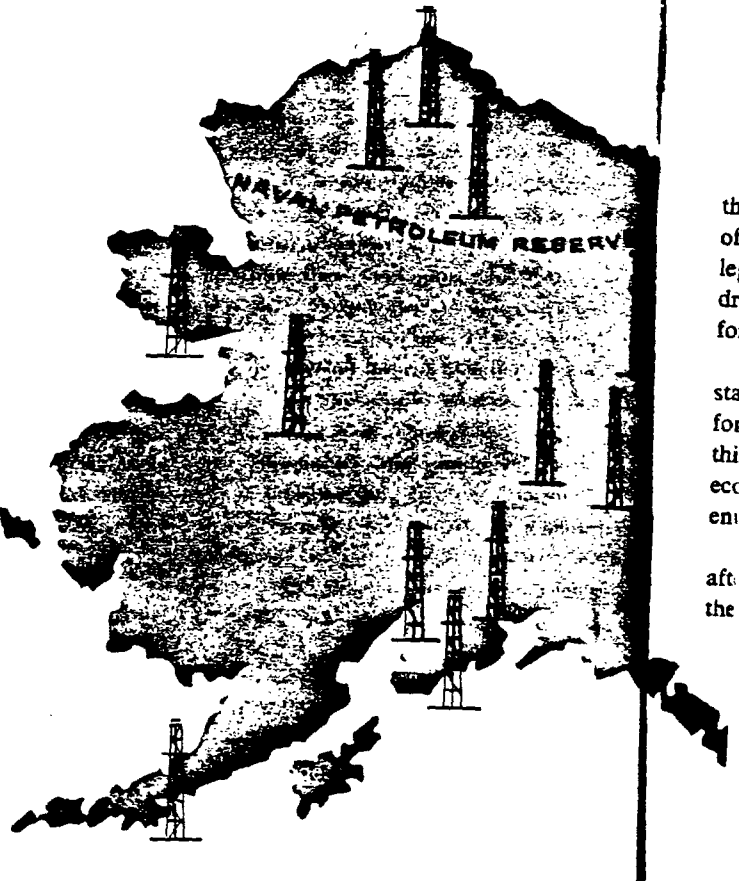
"Many home owners want to keep their dwellings . . . and move them to new locations."



This die-hard is part of the small minority that refuses to sell its land and forces the state to resort to legal action to acquire property.



Expensive as actual construction work is, it is sometimes exceeded by land acquisition costs.



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BIG SEARCH IN THE GREATCC

By Stanton P. Nickerson

**Successful wells in Alaska spur
widespread efforts to locate and tap
vast potential oil reserves**

ACCORDING to an Eskimo legend, two children are responsible for oil in Alaska.

Like youngsters everywhere, the brother and sister often broke the family rule about coming inside in time for supper. They preferred to stay outdoors and play. Such repeated disobedience so angered their father that one night he told them never to come home again. For further punishment, he compelled them to wander across Alaska's tundra and over its mountains forever.

With only an oil lamp to guide them, the boy and girl began their endless trek. As they stumbled over rough terrain, the valuable oil was spilled—some in the north, some in the south, some in the east and some in the west.

Generations of native tribes have handed down this mythical explanation for the surface seepages of petroleum found in the forty-ninth state. The legend is being retold again as exploration and drilling crews are searching with renewed intensity for Alaska's vast but undetermined reserves.

With the former territory now a fully-accredited state, it particularly needs ample low-cost energy for further growth and development. In supplying this energy, oil can contribute to a more stable economy, increase employment and add to revenues flowing into local treasuries.

Interest in Alaskan oil soared to new heights after Richfield Oil's big strike at Swanson River on the Kenai Peninsula, 40-odd miles southwest of

Anchorage, in 1957. It was further spurred by Standard of California's comparable success nearby.

Other sections with bright potentials include the Alaskan Peninsula, pointing its finger toward the Aleutian Islands; the Koyukuk basin west of Fairbanks; the Katalla-Yakataga region just north of the state's panhandle; the Seward Peninsula facing Bering Strait; and such widely scattered areas as the Porcupine and Copper River valleys.

Confidence in the existence of major pools in these and other parts of the state, including the tidelands, is based upon solid evidence.

A recent report by the United States Geological Survey indicates that nearly a third of Alaska has oil and gas possibilities. As a whole, the state is part of one of the world's four great intercontinental depressions favorable to petroleum accumulations. Fossils and rock formations similar in many ways to those associated with highly productive oil regions have been found there.

Big Potential in Naval Reserve

Although the federal government has made relatively little use of its Naval Petroleum Reserve in Northern Alaska, estimates of its potentials range from 30 to 90 million barrels of crude and from 370 to 900 billion cubic feet of gas. Yields from wells in the Reserve and elsewhere in the state easily meet commercial quality standards.

Of course, data must be obtained to pinpoint reserves more precisely, and to estimate their sizes with reasonable accuracy. Lack of such essential information explains to a large extent why there are now only two wells producing commercially.

But prospects for more of them never have been brighter. A successful new oil and gas well completed this August in Canada's Yukon Territory, adjoining eastern Alaska, is accelerating hopes for additional discoveries.

The recent extension of Alaskan geophysical projects has included sending dozens of helicopters whirling over muskeg and mountains to pick sites where wildcat crews can drill. Seismic exploration in coastal waters is continuing this fall.

All this is a far cry from the Alaskan oil scene at the century's beginnings. The first successful well

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Geologists, like these two working jointly for Ohio Oil and Humble, use helicopters to reach remote sites.

was completed in 1901, but interest was short-lived. That was the year when the spectacular strike at Spindletop focused attention on Texas and other parts of the southwest. Since those days, and until recent years, sporadic drilling has resulted in a mere trickle from the entire peninsula. Only about 150,000 barrels of Alaskan oil had been produced by private enterprise through the 1930's.

World War II needs for oil touched off further exploration and drilling in the Naval Petroleum Reserve, followed since V-J day by the efforts of an increasing number of oil companies in other sections, beginning in 1953 around Cook Inlet.

Among oil companies with Alaskan leases are Texaco, Shell, Standard of California, Sinclair, Phillips, Continental, Union, Sunray Mid-Continent, Ohio Oil, Richfield, Amerada, Kerr-McGee, Superior Oil, Colorado Oil & Gas, Humble, and Frankfort Oil.

In addition to these lease-holders, other firms actively engaged in exploration for oil in the forty-ninth state include General Petroleum, Western Gulf Oil, Great Basins Petroleum, British American Oil, Pan American Oil, and El Paso Natural Gas Company.

Of the many problems facing those looking for Alaskan oil, high costs are outstanding. Where an

average deep well in other states may require an investment of \$200,000, a similar test in Alaska will run to about \$1 million. And like oilmen everywhere, wildcatters in the new state never know whether such large expenditures will mean gain or total loss.

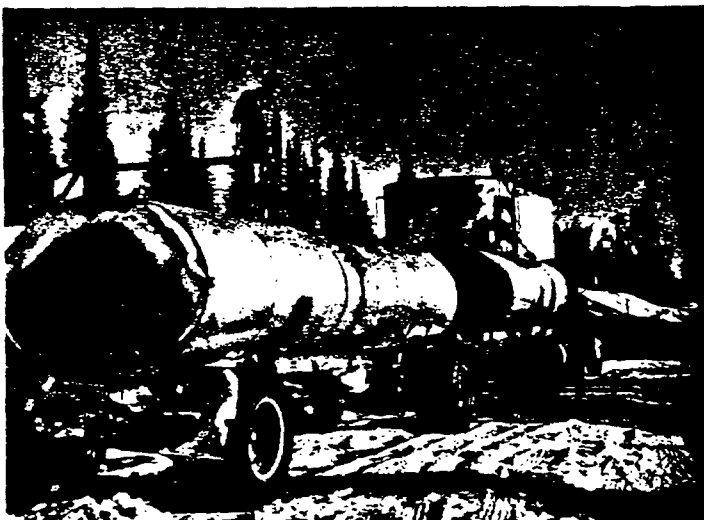
Climate has a direct bearing on the progress of Alaskan oil development. Although the uninitiated are apt to think of the area as a wilderness of igloos, ice and snow, much of the peninsula is temperate. Even so, there are seasonal barriers to exploration and drilling. Especially on the Arctic slopes, most outdoor activities must be confined to summer months.

Shipping by Tanker

As soon as oil from Alaska is forthcoming in larger quantities, it is likely to become a competitor of Canadian sources in supplying western refinery needs. Shipping crude by tanker from Gulf of Alaska ports like Seward would compare favorably in cost with bringing oil into the United States via the Transmountain Pipe Line from western Canada.

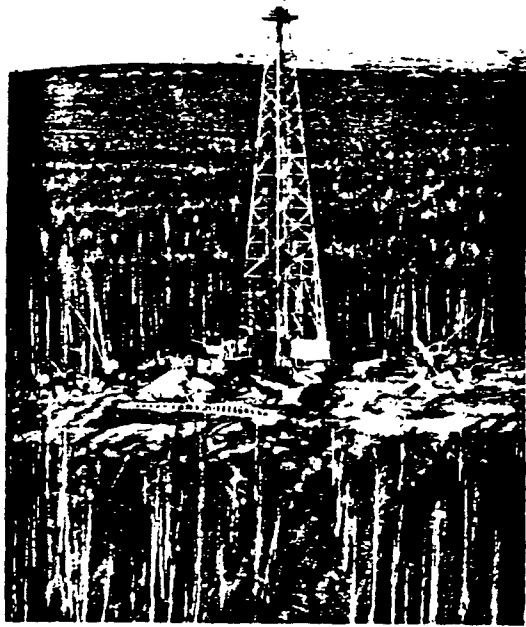
A question frequently asked is "How about refineries in Alaska?" The only one ever built was destroyed by fire in 1933. From a defense standpoint alone, there are valid reasons for replacing it.

Oil from producing wells and supplies for field camps are hauled by trailer-trucks and tractors.



Bustling and prosperous, Anchorage is Alaska's largest center for community, with a population of some 35,000. It is a major center for the Alaskan Peninsula.





Endless forests stretch in every direction around this isolated rig, miles from the nearest hamlet.

A local refinery also would reduce the comparatively high prices paid for petroleum products now imported from other states.

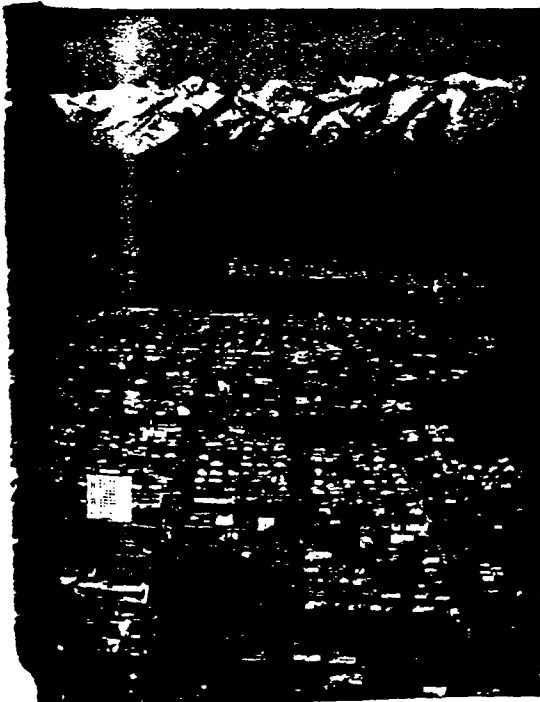
Initial processing units need not be large. With Alaska's requirements for all purposes totalling about 15,000 barrels of oil per day, a refinery with an output of 20,000 barrels per day would be adequate. Sufficient crude should be available from local wells, of course, to justify construction.

A noteworthy index of how Alaska intends to become an intelligent partner of the nation's 31 other oil-producing states is its membership in the Interstate Oil Compact Commission. This cooperative organization is concerned with promoting voluntary measures for efficient utilization of petroleum resources, including conservation. The state also has its own conservation laws.

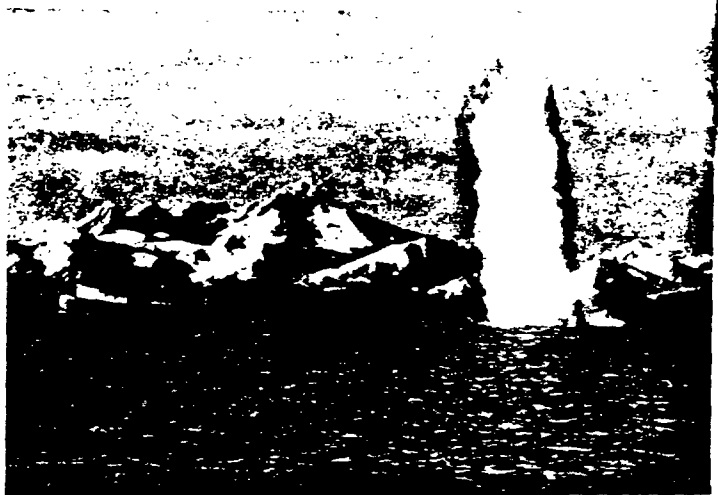
In the light of Alaska's growing importance to the national economy, the public's initial attitude toward the region seems doubly ridiculous today. When the territory was purchased from Russia in 1867 for \$7 million through the efforts of Secretary of State William H. Seward, the acquisition was dubbed "Seward's icebox" and "Seward's folly."

Currently, there is every indication of much more accuracy in the Eskimo meaning of the state's name—"the great country." #

ge...er for oil companies exploring and drilling on the is... Peninsula and other promising regions nearby.



Offshore seismic crews, idle during the summer fishing season, are busy this fall in Cook Inlet waters.





FOREIGN CARS and DOMESTIC FUELS

Imported models perform well on American gasolines and oils, Ethyl survey shows

THE LARGE MAJORITY of the growing number of foreign car owners in the United States is very satisfied with the performance of these cars and with the durability of their engines.

This is the principal conclusion drawn from a survey of owners of imported automobiles conducted by Ethyl Corporation as part of its continuing program of observing the performance of engines, fuels and lubricants. It is particularly significant in view of the tide of foreign cars that has flowed into this country in recent years and the fact that American fuels and lubricants have somewhat different specifications than those on which most of the cars were designed to operate.

The findings of the survey are especially interesting to oil refiners and marketers, foreign car dealers and repair shops, and prospective owners of such cars. They give assurance that domestic gasolines, oils and greases provide maximum performance for these vehicles just as these petroleum products do for cars of American manufacture.

The survey results further substantiate the findings of road tests of foreign cars conducted at Ethyl Corporation's research laboratories at San Bernar-

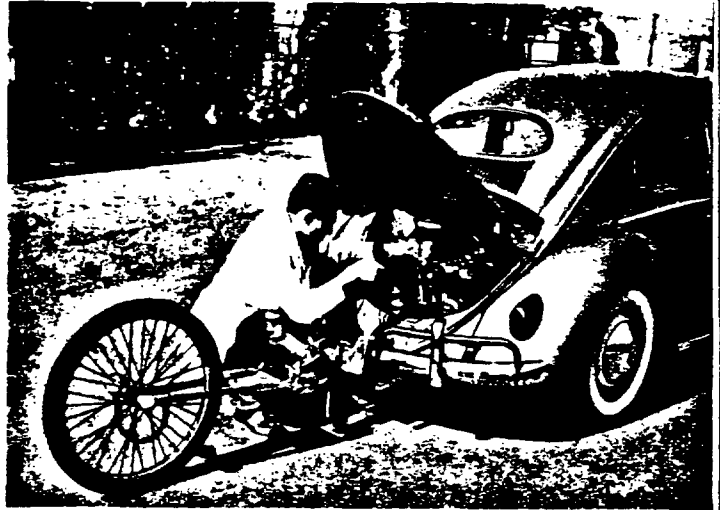
dino, Calif. These tests demonstrated, too, the high degree of compatibility between foreign cars and domestic fuels and lubricants.

In analyzing the driving and buying habits of the imported automobile owners covered in the Ethyl survey, it is found that over three-fourths use their cars predominantly in city and suburban areas. Of the total sample, 76 percent has so-called economy cars and the remainder higher priced or sports-type models. There is little or no difference in the degree of satisfaction which the two groups expressed toward their cars.

Some 69 percent of the entire group generally uses regular grade gasoline, while 29 percent normally buys premium. Broken down further, the survey results show that, as might be expected, the higher priced, sports-type car owners tend to use premium (71 percent) and "economy" owners use, for the most part, regular grade (83 percent). Satisfaction with fuel economy runs very high among all owners.

In general, the foreign car owners are pleased with the three performance factors studied—spark plug, muffler and valve life—and with overall

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The findings of the owner survey substantiate the results of foreign car tests conducted at Ethyl Corporation's laboratories at San Bernardino, Calif.

durability. A large majority had not found it necessary to replace mufflers or valves. Of those who had replaced spark plugs (about 60 percent), more than half had done so at between 6,000 and 15,000 miles.

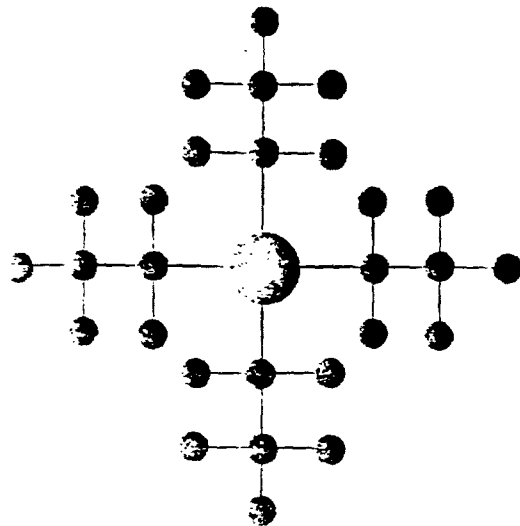
The grade of gasoline used has little effect on the degree of satisfaction expressed by owners, regardless of type of car owned. Regular gasoline users reported satisfactory spark plug, muffler and valve life in the order of 94, 91 and 89 percent, respectively. Premium users reported satisfaction with the life of these components in the order of 90, 86 and 87 percent.

Since the gasoline used in the cars during the time reported on in the survey had a national average of about 2.0 ml. of tetraethyl lead for regular gasoline and 2.55 ml. for premium, it is apparent that the TEL content of the gasoline had no significant bearing on the life of engine parts.

Copies of the Ethyl survey findings, entitled "A Study of European Cars Operated in the United States," are available at Ethyl Corporation offices throughout the United States and from Ethyl Corporation of Canada Limited in Canada. #



In analyzing driving habits, it was found that over three-fourths of the owners surveyed use their imported automobiles mostly in city and suburban areas.



Modern Al that may ch

New breakthroughs in organometallic chemistry are expected to speed progress in everything from rocket fuels and plastics to synthetic fibers and miracle drugs

By John C. Lane

Ethyl Corporation Research Laboratories

OF ALL CHEMICALS whose future possibilities are truly exciting, none have brighter prospects than the organometallics. Tetraethyl lead is the principal one in use today—but TEL may be only the beginning.

Research workers in the field say that organometallics will figure importantly in everything from rocket fuels and plastics to synthetic fibers and miracle drugs—besides growing in stature as fuel and lubricant additives.

Recent scientific breakthroughs in organometallics, in fact, may literally revolutionize our lives. This is because these compounds, with their unique chemical and physical properties, are now becoming available for many new applications.

A characteristic of organometallics is the way in which metal atoms are linked with carbon atoms. Such combinations are almost endless, and the results are sometimes surprising. For example, adding a metal to a solid may produce a liquid. Or adding a metal to a liquid may give a solid.

What organometallics do, in many cases, is to impart radically new properties to a chemical com-

ound. Take butyl chloride, for instance—an organic chemical containing only carbon, hydrogen and chlorine.

Butyl chloride has no fungicidal properties. But by incorporating tin, this inert organic chemical becomes a potent fungicide, tributyltin chloride, now used by paper mills to prevent mold in their process water. Similarly, adding a metal to a chlorinated hydrocarbon type of insecticide increases its potency.

Old Yet New

Many other organic chemical products can be improved in similar ways, including plastics, synthetic fibers and medicines. New drugs showing promise of combating mental illness, and others that appear to inhibit cancer growth, are among the revolutionary innovations affecting human life.

Organometallics are among the newest and the oldest organic chemicals to be synthesized.

The first one was created quite accidentally in Germany in 1849. Organo-arsenicals and organo-magnesium halides were developed at the turn of

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Alchemy change our lives

the century. This pioneering work paved the way for a number of modern drugs and medicines. Investigations on organolithium compounds in the 1930's and on the alkylaluminums in the 1950's have been milestones in broadening the usefulness of organometallics.

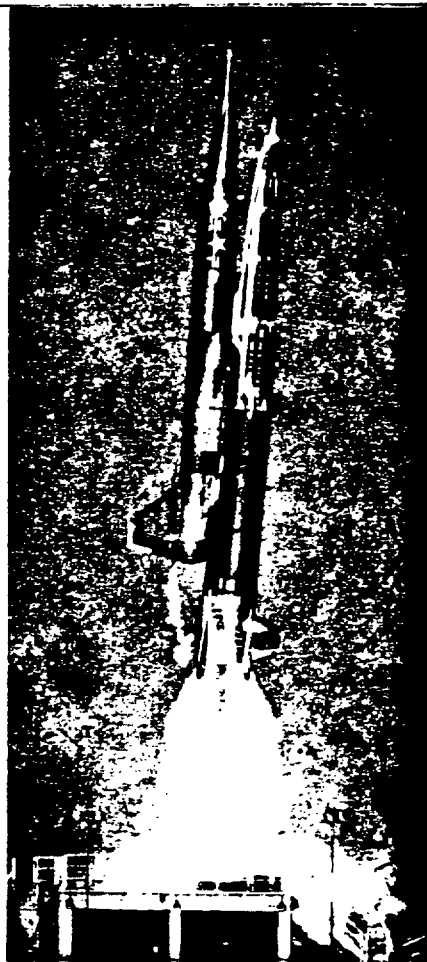
Knowledge of how organometallics could be made was limited until 1951, when the production of ferrocene, a complex chemical containing iron, shed new light on the atomic behavior involved in creating compounds of this kind. An innovation of great importance, it has greatly multiplied the number and kinds of organometallics which can be formed. The vast new field opened up by this discovery is being investigated extensively.

Silicones Second

Although tetraethyl lead is the principal organometallic product in use today, others have widespread applications. The silicones are in second place, after TEL. These fairly new compounds already have more than 500 uses. Of the total silicone output, about 35 percent goes into a special-purpose synthetic rubber, 20 percent into resins and plastics, and the remainder into temperature-resistant lubricating oils, hydraulic fluids and other specialty products.

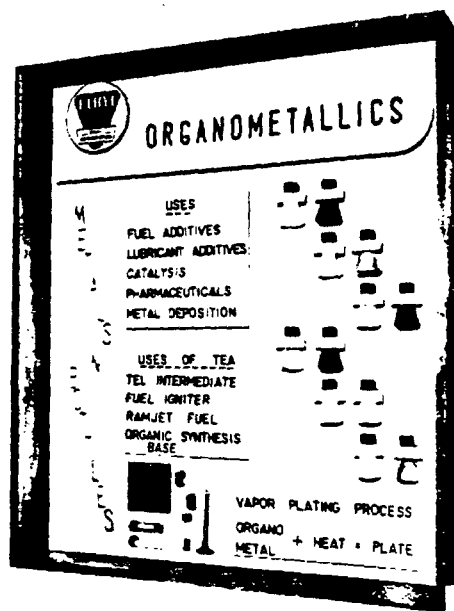
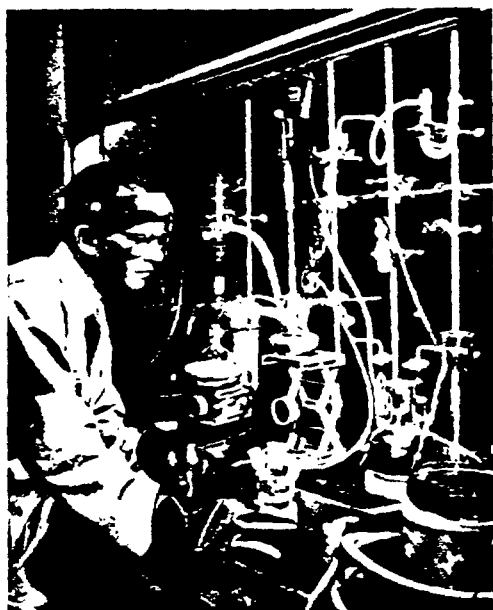
Third place is probably held by the alkyltin compounds. Their largest present use is in stabilizing polyvinyl chloride plastics. However, a promising new use is as a fungicide.

Despite the fact that U. S. capacity for heat-stable polyethylene plastics now amounts to about 450 million pounds, the use of alkyl aluminum catalysts for this purpose probably totals no more than a million pounds. This is because only about a quar-



Tetraethyl lead and Ethyl's new manganese antiknock are two organometallics now added to gasolines. Others are expected to play a major part in future air and ground fuels and lubricants.





An Ethyl research scientist exploring new organometallics and a display panel showing some of the many uses for the chemicals. To date, the Company has made more than 3,000 of them.

ter of one percent of the catalyst is needed for each pound of plastics. However, plastics and other promising areas may boost the annual demand to many times the present level.

Organometallic catalysts are valuable in making a new synthetic rubber identical with natural rubber. They also are used in creating almost 300 million pounds of organic chemicals annually. And they are effective in a recently developed German process for producing a host of useful chemicals from acetylene.

New Antiknocks

Ethyl Corporation, as the leading producer of tetraethyl lead, has explored the organometallics field intensively for many years. During this search, Ethyl has made more than 3,000 separate organometallics.

The major part of these research efforts has been to find potential new antiknocks and other additives for petroleum products. Out of this vast effort has come a superior new class of antiknocks, the cyclopentadienyl manganese tricarbonyls, which show great promise as supplements to tetraethyl lead (see pages 1-4).

Other possible uses for organometallics are being explored. And the Company is cooperating with

those who have problems that organometallics might solve.

Organometallic compounds are by no means easy to prepare. But with the right know-how, they can be tailored to fit a specific need. This is illustrated by work at Ethyl's laboratories. Made one way, a group of organometallics will dissolve in water, evaporate readily, and conduct electricity. Made another way, they will instead be nonconductors and dissolve in gasoline, oil and other hydrocarbons.

The chemical action and properties that fit an organometallic for a particular job may stem from one or all three of its component parts—the organic portion, the metal itself, and any other chemical element or grouping that may be bonded to the metal. This fact offers great opportunity for stepping up or toning down the activity of chemicals already known to be useful for a given job. And it permits combining different desired types of activity in a single new chemical.

Because the number of organometallics that can be made is practically limitless, it is virtually impossible to predict their future potentials. One thing is sure, however: the use of organometallics as catalysts or chemical intermediates in making new and better products is growing fast.

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Boron-containing organometallics, for example, are being made for high energy fuels in missiles. Alkylaluminum compounds are being used as igniters for rocket fuels, since they burn on contact with liquid oxygen. Compounds combining light metals, like lithium, with hydrogen are among the chemical rocket fuels offering maximum specific impulse, which means greater range and higher payloads.

Previously undreamed-of possibilities for protective plating of base metals and other materials are offered by the organometallics. One reason is that many metals form organometallic compounds that will deposit their metals on contact with a hot surface. In this method of plating, the material being plated need not be electrically conductive, as is necessary in electroplating.

Other applications of metal deposition from organometallics include "printing" electrical circuits for radio and television sets, making transistors for similar use, and welding metals together without employing very high temperatures.

Metals in Plastics

Incorporating metals into plastics might make very useful products having heat resistances midway between plastics and ceramics. Metal-containing plastics can be made by converting organic compounds into organometallic ones and then polymerizing them.

A similar technique might be used to make metal-containing oils for high-temperature lubrication jobs in aircraft, missiles and space ships.

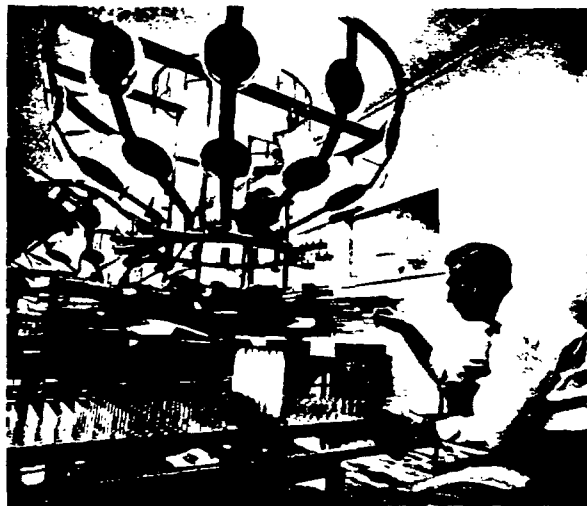
Organometallics need not be oil-like to give good lubrication. Some are known which decompose on rubbing metal surfaces, forming a friction-reducing film between them. Such films provide effective lubrication in cases where the pressure of the moving part would force oils from between them, leaving the rubbing surfaces unlubricated.

Finally, there is the field of automotive transportation. Tetraethyl lead has been the only successful antiknock to be produced commercially to date. However, other organometallic compounds, including Ethyl's new manganese antiknock, promise greatly to extend the usefulness of TEL.

Looking still further ahead, it is almost a foregone conclusion that organometallics will play a major role in future fuels and lubricants. #



Organometallics work wonders in many products, including fungicides and insecticides. . .

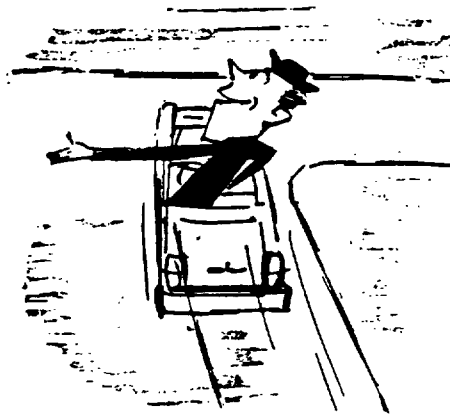


synthetic fibers . . .



and miracle drugs.

In advocating consistent rules of the road,
the National Committee on Uniform Traffic
Laws and Ordinances is . . .



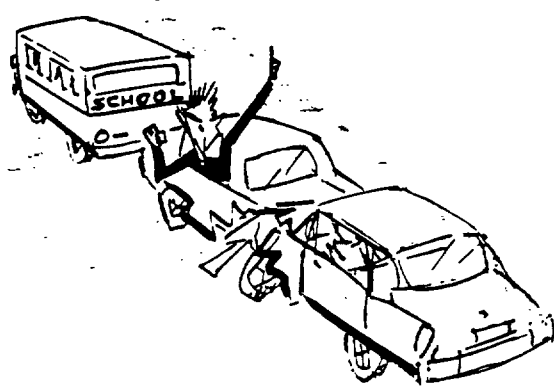
Driving for Better Driving

By Thom Yates

ARE WE as a nation doing all we can to reduce the number and severity of highway accidents?

The National Committee on Uniform Traffic Laws and Ordinances, for one, thinks not—especially when it comes to consistency of motor vehicle legislation.

The National Committee is striving to promote highway safety by achieving the adoption of highway laws that would be the same in every community and every state from Florida to Alaska and Hawaii. Uniform traffic laws would go a long way to reduce accidents. They also would cut down confusion, traffic disorders and other existing barriers to interstate commerce and travel.



Today, NCUTLO says, we have a "jungle" of laws so different in spirit and letter that even the most responsible citizens run the risk of accidents and law breaking.

Here are a few examples of what the group has in mind:

- A driver signals for what apparently is a left turn, but actually turns right or even comes to a full stop. (The same hand-and-arm signals mean different things in different states.)

- A motorist stops for a school bus only to have the car behind ram into him—or at least blast him with its horn. (Rules for stopping while a school bus is loading or unloading vary widely from state to state and even county to county.)

- A driver who has made the required full stop, waited for a break in traffic, and then started across a main thoroughfare, has his life and property endangered by a driver on the main road who insists on barging through. (Depending on the state in question, both drivers have the right of way.)

- All drivers face a hodge-podge of confusing traffic signs, signals and markings. (There are a great number and variety of signs, often in clusters of five or more, whose instructions motorists are expected to heed.)

- Many innocent victims of automobile accidents find to their dismay that they are not protected

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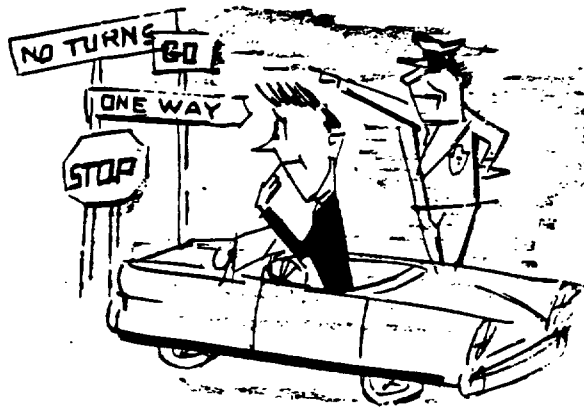
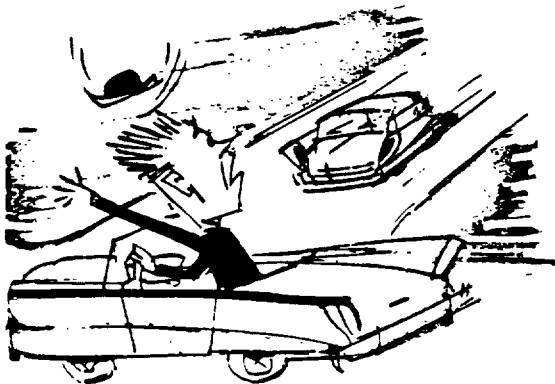
against financial loss. (Several states have weak financial responsibility laws.)

These are but a sampling of the hundreds of inconsistencies that the National Committee on Uniform Traffic Laws and Ordinances is seeking to overcome through adoption, either in whole or major part, of its 177-page Uniform Vehicle Code and its 56-page Model Traffic Ordinance. The former is a guide for states, while the latter is a suggested set of laws and regulations to govern traffic within communities.

While always optimistic, the National Committee views realistically the adoption of uniform traffic laws by the various states. There is little prospect that all states will do as Wisconsin did in 1957—completely overhaul their motor vehicle laws and draw up a new code virtually identical to that proposed by the National Committee. It is hoped, however, that the states will adopt the Uniform Code bit by bit in coming years.

Four Points Have Priority

With the latter prospect in mind, the National Committee has given priority to obtaining widespread adoption of at least four major phases of its proposed code. These are: (1) Rules of the road (laws governing the movement and behavior of vehicles in highway traffic); (2) Frequent and regular inspection of all motor vehicles (presently only 14 states require inspection); (3) Establishment of a separate motor vehicle department in each state (in many cases, the motor vehicle department is a stepchild of some other state department, such as Revenue or Finance); and (4) Sound driver licensing, including standard drivers' examinations and effective legal punishment of accident repeaters and habitual law violators.



In its efforts to get individual states to adopt the Uniform Vehicle Code, or at least major segments of it, the National Committee analyzes proposed motor vehicle legislation and points out how it differs from the Code. The analyses are distributed by the American Association of Motor Vehicle Administrators, in Washington, D. C.

The 100 members of the National Committee on Uniform Traffic Laws and Ordinances are all widely experienced. They include motor vehicle administrators, traffic court judges, traffic engineers, educators, and representatives of such organizations as the American Automobile Association, American Bar Association, AFL-CIO, American Trucking Associations, Automobile Manufacturers Association, Automotive Safety Foundation, National Safety Council, International Association of Chiefs of Police, Insurance Institute for Highway Safety and National Highway Users Conference.

Advantages of Uniformity

In pointing up the safety value of its work, the National Committee reports that 20 percent or more of the highway accidents in some states are caused by out-of-staters unfamiliar with local driving habits and regulations. This figure, the Committee is certain, could be drastically reduced with uniform traffic laws and enforcement.

As desirable and vital as accident prevention is, it is but one of the fruits to be gained by adoption of uniform motor vehicle laws by all 50 states. According to the National Committee, "The long history of confusion in the field of motor vehicle legislation would be at an end; safety conditions on the highways for motorists and pedestrians would be enormously improved; law enforcement would be facilitated and made more effective; the civil right of suit would be given new protection; and the incapable or irresponsible driver would disappear from the nation's highways."#

CALIFORNIA CARAVAN

SAN BERNARDINO

DETROIT

After a combination research and transportation trek, an Ethyl laboratory was established in the far west almost 25 years ago

By John S. Wintringham
and Michael A. Remondino



John S. Wintringham and Michael A. Remondino, the authors of this article, are both veteran employees at Ethyl Corporation's Research Laboratories in Detroit.

Mr. Wintringham joined the staff there in July 1930, immediately following his graduation from Harvard University with a B.S. degree in mechanical engineering. He has held many key supervisory and engineering positions and at present is research advisor responsible for special projects.

Mr. Remondino started working at the Laboratories in February 1933, a year before he received his B.S. degree in aeronautical engineering from the University of Detroit. He was an engineer at the Company's San Bernardino, Calif., laboratory from its formation in 1935 until his transfer back to Detroit in June 1942. In 1951, Mr. Remondino was named a research representative of the Ethyl Laboratories, his present position.

IN JUST A FEW MONTHS, it will be 25 years since several of us took part in a combination research and transportation trek from Detroit to San Bernardino, Calif., but we still refer to it as the "California Caravan." And when you use the word in its truest sense, that's just what it was.

According to the dictionary, a caravan is "a company of travelers on a journey through desert or hostile regions." Part of our journey was through the Mohave Desert. And we did encounter one law enforcement officer, who, if not truly hostile, certainly was unsympathetic for a time.

But we are ahead of our story . . .

What led to the historic "California Caravan" in the first place? The answer is automobile progress—the rapid progress that was being made in automobile engines in the early 1930's. Advances in engine design simply had outrun testing methods. Newer cars, far more rugged and efficient than their forerunners, no longer could be given breakdown tests in just a few miles of travel.

Ever since 1927, when Ethyl's engineering laboratories had been organized, the General Motors

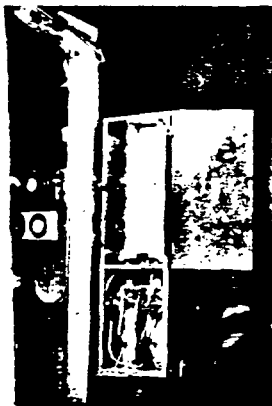
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DETROIT

Proving Ground near Detroit had been used for endurance and durability tests. But since the oil and automotive industries had come to rely on Ethyl as a source of reliable fuel-engine-lubricant data, the time had come for the Company to have its own road testing facilities.

So it was in 1934 that many areas of the country where a road test laboratory could be located were explored and San Bernardino was finally selected. Within only a 60 to 90-minute drive of San Bernardino lies "a United States in miniature"



Here's one of the big truck-trailers fully loaded for the trip, and a close-up of some of the equipment used to obtain durability data. . . . At the bottom of these pages the caravan is lined up on Murac Dry Lake, a vast expanse of California desert land, now the site of Edwards Air Force Base, experimental aircraft test center. The area formerly was part of an Ethyl test course.



—an area where virtually every type of driving and weather condition in the country can be duplicated.

When San Bernardino was decided on, a former automobile showroom at 863 E Street was leased as the temporary laboratory, and back in Detroit, the California Caravan of three passenger cars and four truck-trailers was organized.

All seven vehicles were purchased new for the trek, since they also were to serve as the San Bernardino Laboratory's first test fleet. The cars, all 1934 model sedans, were a Buick, an Oldsmobile and a Ford.

Kept Records and Blended Fuel

W. O. Schulze, who was to be manager of the San Bernardino laboratory, drove the Buick, and his wife and 2-year-old daughter went with him. In the Oldsmobile were Hugh Hughes, his wife and their two sons, about 8 and 11 years old. Hugh, no longer with Ethyl, was a Company mechanic at the time. We—John Wintringham and Mike Remondino—drove the Ford. We also kept all of the records, blended fuel and made all adjustments on the cars and truck-trailers.

The truck-trailers carried two farm tractors for use in engine-fuel tests on the Mohave Desert, two automobiles owned by members of the Caravan, and a wide assortment of furniture, instruments and test equipment.

At the wheel of one of the truck-trailers was Miner Gamble, now retired from Ethyl, with his wife proudly perched in the cab beside him. Richard Beaubier, Melzer O. Prior and Wesley M. Price were the other regular drivers, and Byron Lord was the relief. Wes Price and Dick Beaubier are still with the Company, at the Detroit Laboratories.

Looking back on it, the Caravan was a happy experience, but it was far from a pleasure jaunt. Every revolution of the vehicle wheels was in the interest of research. The cars and trucks were equipped and instrumented to obtain valuable endurance and durability data on the 2,400-mile journey.

We arranged the 6-cylinder engines of the big units so that each three cylinders would operate on a blend of fuel, or have an air-fuel ratio different

ETC 28178



from the neighboring three. More than once, we took exhaust gas samples and changed carburetor jets to get the proper air-fuel mixture while the truck-trailers were still rolling over the highway.

We also did our fuel blending as we traveled. Near the end of each day's run of about 200 miles, the vehicles' gasoline tanks were filled with unleaded fuel purchased at a convenient service station. We added "Ethyl" antiknock compound from our own supply of regular and experimental formulations. Information obtained on the Detroit-San Bernardino trek contributed importantly to an improved antiknock compound Ethyl soon offered to its customer companies.

Painstaking Preparations

Careful planning went into the Caravan's route. The motor vehicle office of each state we traversed was contacted in advance in regard to such things as special license fees, highway restrictions, underpass heights and cargo restrictions. Similarly, there was advance contact with the local police department in each community where we planned to stay overnight. This was to be sure our vehicles could be parked where they would not hinder traffic and still be safe from curious citizens and night prowlers.

After a busy week of loading the truck-trailers and of making the engine adjustments necessary for our over-the-highway research, the trip began

on the morning of February 28, 1935. Nobody made a speech or broke a champagne bottle over the hood of any vehicle as we pulled away from the Research Laboratories (then at 723 East Milwaukee Ave., in midtown Detroit), but we did get a rousing vocal sendoff from our fellow-employees.

Our trip across northern Indiana and through Illinois, Iowa and Nebraska was rather uneventful, but things changed when we reached Wyoming. Between Cheyenne and Laramie, we ran into a blinding snowstorm. It was so heavy and so much snow drifted in through the car windows we had open for ventilation that the drivers actually had to wear overshoes to keep their feet dry. The next day we rode in sub-zero weather. In fact, it was 15 below when we reached Parco (now Sinclair). Wyo., for our overnight stop there.

On our 11th day out of Detroit, after five days of blizzards and below-zero temperatures in Wyoming and northern Utah, we were greeted by the signs of approaching spring. This was at St. George, Utah, near where that state, Arizona and Nevada come together. We had our first sunshine in almost a week and saw some early-blooming flowers.

It was in Nevada that we encountered the unsympathetic police officer. He stopped us en route to Las Vegas, our final overnight stay, to see why we had no special licenses. The letter we carried from the Nevada Secretary of State meant nothing

When the California Caravan reached its destination, Ethyl research operations were set up in this former automobile showroom. The present laboratory building on the outskirts of San Bernardino (far right) was opened three and a half years later, in 1938.



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to the officer since there had been a change in the Secretary of State's office and he was not inclined to attach much validity to a letter from the retired official. We still don't know how he did it, but Bill Schulze got us out of that difficult situation without inconvenience—and without paying any special assessments.

Finally, late in the afternoon of March 11, 1935, our caravan arrived in San Bernardino. Detroit was 12 days and 2,400 miles behind. San Bernardino was glad to have this new Ethyl enterprise—particularly because it would employ several local citizens in those Depression days—and we were glad to be there.

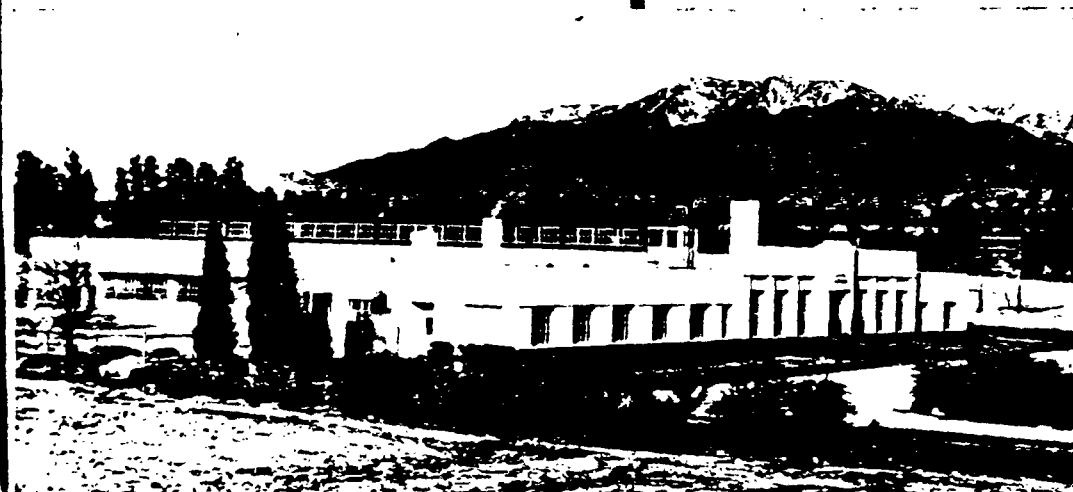
That's how the Ethyl research laboratory was established in Southern California.

Present Laboratory Opened

It occupied the temporary quarters at 863 E Street until October 1938, when the present laboratory building on the outskirts of San Bernardino was opened. From this base, during the past 21 years, fleets of passenger cars and heavier vehicles have rolled up millions of test miles as Ethyl has continued durability, performance, efficiency and other studies to help the petroleum and automobile industries provide ever-better transportation. #



In the years since the Ethyl laboratory was established in San Bernardino, the long miles of rugged mountain and scorching desert roads in the area have become familiar to test drivers.



Ethyl Research Fellowships Awarded for 23rd Year



GRADUATE RESEARCH fellowships at 21 colleges and universities and an undergraduate scholarship at still another college have been awarded by Ethyl Corporation for the 1959-1960 academic year. This is the 23rd consecutive year that the Company has supported higher education in this way.

The fellowships are in the fields of chemistry, chemical engineering, mechanical engineering, industrial engineering and science teaching, while the scholarship is in chemical engineering. Most of the fellowships carry a stipend of \$1,800 each for living expenses plus an allowance for tuition and fees. In addition, each university department concerned receives an award of \$600 for expenses in connection with the fellow's research work. Total value of the grants is about \$60,000.

Institutions at which Ethyl's 1959-1960 fellowships are held, the fields of study, and the names of the recipients are:

University of Cincinnati, chemistry, Roger D. Barry; Columbia University, science teaching (individual fellows are not identified with contributing companies); Cornell University, mechanical engineering, Richard Beck, Jr.; University of Delaware, chemical engineering, Robert E. Zumwalt; University of Detroit, chemistry, Donald R. Bahr; Florida State University, chemistry, Larry Plonsker; University of Florida, chemical engineering, Allen E. Leybourne, III.

Georgia Institute of Technology, chemical engineering, Olin M. Fuller, Jr.; University of Illinois, chemistry, Donald A. Wenz; State University of Iowa, chemistry, Ernest L. Yeakey; Iowa State University, chemistry, Daniel O. Carr; University of Kansas, chemical engineering, Jerry L. VandenBoom; Louisiana State University, chemical engineering, Byron L. Rogillio; University of Minnesota, mechanical engineering, Albert W. Black, III; Ohio State University, chemistry, John A. Sedlak.

Oklahoma State University, industrial engineering, David G. Gates; Purdue University, chemistry, Thomas V. Liston; Tulane University, chemical engineering, Allan R. Bundy; University of Tulsa, chemical engineering, Clyde M. Haas; Wayne State University, chemistry, Enver Mehmedbasich; and University of Wisconsin, chemistry, Richard P. Wendt.



Radioactive Tracer Studies Point Way to Better Fuels

TRITIUM, a form of radioactive hydrogen, may point the way to better gasoline mileage and improved engine performance, Dr. D. E. Cooper, of Ethyl Corporation's research laboratories, told the Division of Petroleum Chemistry at the 136th national meeting of the American Chemical Society, in Atlantic City, N. J., in mid-September.

By using the tritium as a radioactive tracer, Ethyl scientists have been able to measure the quantity and quality of gasoline entering each cylinder of an automobile engine. The resulting data may make it possible to impart better performance characteristics to the gasoline and achieve better distribution of the fuel throughout the engine. More power, greater fuel economy and better engine operation are expected to follow.

Dr. Cooper's paper was one of four presented by Ethyl research scientists at the ACS meeting. The other three were given before the Division of Inorganic Chemistry by Dr. Rex D. Closson, Dr. H. E. Rodall and Dr. H. E. Petree. They discussed recent breakthroughs in organometallic chemistry (see pages 14-17), a new method of preparing high yields of manganese carbonyl, and several new compounds prepared by the reaction of alkyl metal halides with metalloids esters.

New Book Contains Collection of Magic Circle Tour Articles

A NEW BOOK, "Travel Your Magic Circle," written by Edward A. Collier and published by Dodd, Mead and Co., went on sale at bookstores throughout the country in October. The book contains a collection of many of the illustrated Magic Circle tour articles that have been appearing in leading daily newspapers from coast to coast since December 1957. These articles are a part of the publicity campaign supporting Ethyl Corporation's Magic Circle market expansion program. The Magic Circle program uses both newspaper publicity and advertising in leading national consumer magazines to promote increased use of the family automobile for fun and recreation. It thus helps increase the sale of gasoline and other service station products.

ETC 28181



American Capitalism—1959

IF ROBBER BARON is the definition of capitalist, then we are not capitalists at all. In fact, on July 2, 1890, we declared war on monopoly capitalism when the Sherman Antitrust Act became law. That law is still being actively enforced.

There are, for example, 14 million Americans who own shares in American industry. In our country, two-thirds of the gross national product goes into consumption — food, entertainment, refrigerators, automobiles, etc. Three out of four families own their own automobile. Three-fifths of all homes in America which are not on farms are owned by the families that occupy them, and three out of four of our farms are operated by the people that own them. One out of every ten families makes \$10,000 a year or more — triple the proportion of ten years ago. Family income, adjusted for change in the value of the dollar, has gone up 50 percent in ten years.

Economic humanism rather than monopoly capitalism perhaps best describes such a system.

American business prospers at the same time that the federal government, in ways large and small,

pervades our lives — that one adult in five gets regular checks from the government and that federal warehouses give out food to 5,000,000 persons and that 2,000,000 persons live in government-subsidized housing. We live in a welfare state which seeks to put a floor below which no one sinks, but builds no ceiling to prevent man from rising. The plans of tens of thousands of independent producers lead to greater production, a more dynamic economy and a richer life for all.

It would be a mistake to think that business leaders are America's ruling class. There is only one ruling class in this country, and that is the American voter. And whenever the citizens have wanted to change the system, they have done so through the ballot. They can do so again whenever they want to. We have this system today because the rank and file approve it and because it has given them the highest standard of living in the world.

—Henry Cabot Lodge brings Nikita Khrushchev up to date on the American system, before the Economic Club of New York, September 1959, as excerpted in *Time* magazine.

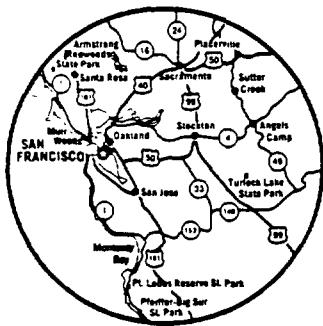


1. Get to know great people. Botanist Luther Burbank's house and gardens in Santa Rosa are as he left them, to the last tool. Explore a bit, and get close to famous names in your area.

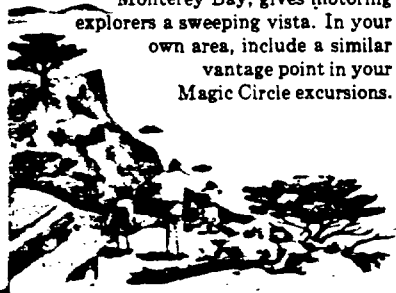
Your car makes any map a Magic Circle

In this Golden Gate Magic Circle, your car puts you on the threshold of a whole wonderful world of fun. And all around you is a Magic Circle just as attractive—simply head out of your driveway to find it.

This series of advertisements is published by Ethyl Corporation, to help you get more enjoyment out of your car. Ethyl Corporation manufactures "Ethyl" antiknock compounds, used by oil companies everywhere to improve their gasolines and your driving pleasure.

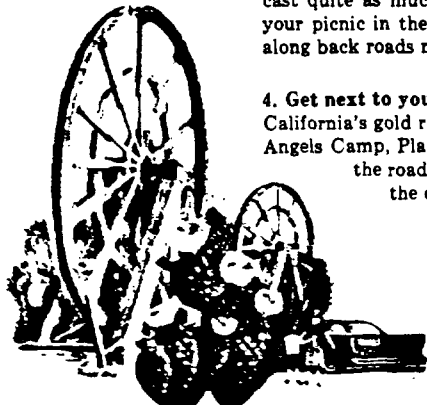


2. Find a lookout spot. Rock-ribbed Point Lobos, at the southern end of Monterey Bay, gives motoring explorers a sweeping vista. In your own area, include a similar vantage point in your Magic Circle excursions.



3. Picnic in the shade. The trees in your Magic Circle may not cast quite as much coolness as California's giant redwoods, but your picnic in the open air will be no less appetizing—the drive along back roads no less delightful.

4. Get next to your local history. Highway 49 leads through California's gold rush country—through Sutter Creek, Angels Camp, Placerville. In your Magic Circle, the roads lead just as surely through the exciting pages of history.



5. Take a pencil and map out your Magic Circle right now. You've got the car, and if you're missing out on this kind of driving, you aren't enjoying half of what your car investment offers you.



ETHY NEWS



ETC 28184

ETHYL NEWS

NOVEMBER-DECEMBER 1959



THE COVER shows one of the country's many dependable fuel oil dealers who make on-time deliveries regardless of weather. Such service is one reason why oil is the most widely used domestic fuel, as you'll read in "Oil Puts the Heat On," on pages 10-12.

**OIL'S FIRST CENTURY
-BORN IN FREEDOM
WORKING FOR PROGRESS**

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CREDITS:
Layouts and art direction by Carsten Grande. Photographs Cover, Shostal by Art D Arazien, pages 1-5, Wide World, Cities Service Co., Tidewater Oil Co., Frederic Lewis, U. S. Air Force, Socony Mobil Oil Co., Esso Research and Engineering Co., Shell Aviation Corp., and Ken Stratton (Pennsylvania Furnace and Iron Co.); pages 6-9, Arthur Leipzig, Robert Yarnall Richie, and Standard Photo Service; pages 10-11, Frederic Lewis; page 12, Fuel Oil and Oil Heat Magazine; page 13, Pach Brothers; pages 16-19, University of Wyoming; page 21, Ford Motor Co., General Motors Corp., and Chrysler Corp.; page 22, Chrysler Corp.; page 23, Frederic Lewis; page 24, U. S. Steel Corp.; page 25, Fortune Magazine by Elmer Smith; pages 26-27, Merrill Chase, Pach Brothers, and Michel J. Sym.

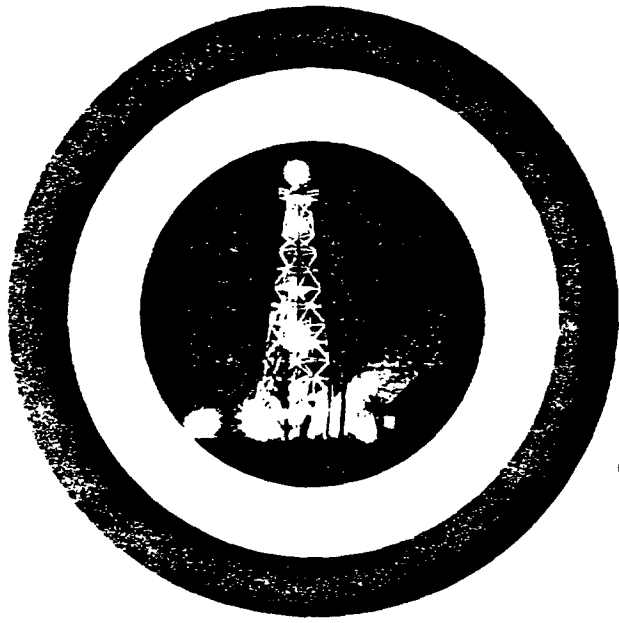
ETHYL NEWS is published by Ethyl Corporation, 100 Park Avenue, New York 17, N. Y. manufacturer of "Ethyl" antiknock compounds and other additives used by oil companies to improve the quality of petroleum products.

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B. B. Turner, President
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in the Fabulous Fifties

The eventful decade was one of growth, progress and contributions for petroleum

OUTSTANDING on the American industrial scene in the decade drawing to a close was the tremendous growth, progress and contributions of petroleum . . . The Fifties had scarcely begun when the industry was called on to fuel another full-scale war—this time half way around the world in Korea. Some 65 percent of all tonnage shipped to our troops was petroleum products . . . Mid-way through the ten-year period, violence flared in Egypt and the Near East. When dynamited pipelines and a blocked Suez Canal choked off the vital flow of oil to Europe, American oil companies mounted a gigantic oil-lift and rushed much-needed products to a waiting continent . . . Beyond these specific emergencies, oil played a major role in the country's defense commitments around the globe, supplying petroleum products to our forces and to the nations of the Free World . . . As it had been from the industry's beginning, research was the birthplace of new and better products and the source of vital contri-

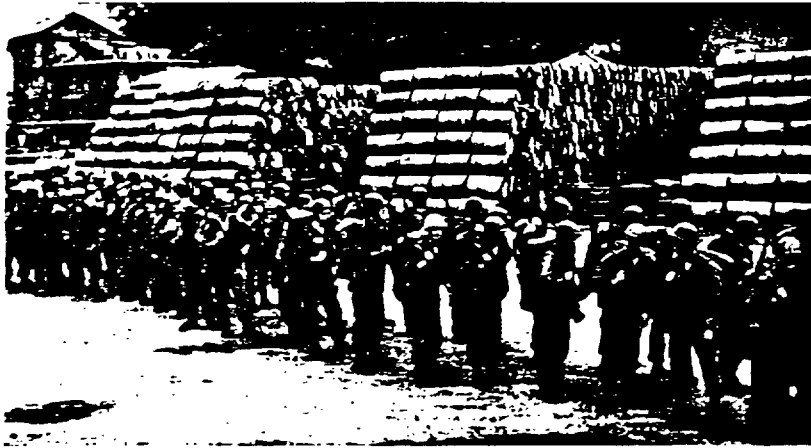
butions in such new fields as rocketry and space missiles. By the decade's end, the industry was investing some \$300 million a year in the unending search for better ways to provide more and better products for more people . . . A daily demand for petroleum that had skyrocketed to over 10 million barrels a day by the closing months of the eventful period sent American oilmen to deep offshore waters and remote jungles and mountains in the search for more reserves . . . The industry built thousands of barrels of new tanker capacity and thousands of miles of new pipelines to bring oil to consumers more efficiently. It developed and built new refinery processes and capacity to manufacture sufficient quantities of a growing number of products for a country and world that was daily becoming more dependent on them . . . Forward-looking marketers opened modern service stations to supply the needs of a motor vehicle population that topped 70 million and continued to grow . . .

OIL IN THE FABULOUS FIFTIES

During the Fifties, the industry looked back with pride and forward with anticipation as it celebrated its Centennial year . . . But the decade was not without its problems—continuing federal control of natural gas prices and threats to percentage depletion, higher federal and state motor fuel taxes, the imports question, and an oversupply of refined products . . . More typical of the Fabulous Fifties,

however, was the launching of the world's largest tanker, the drilling of the deepest well and the construction of the largest refinery ever built at one time.

The pictures and captions on these pages pinpoint some of the highlights of the oil industry's recent accomplishments as it moves into the first decade of its second century.



Left, early in the decade the industry was called on to supply a wide range and large quantities of petroleum products needed by the men and machines of the United Nations forces in Korea. It continued to provide fuels and lubricants for America's troops around the globe and for the nations of the Free World.

Below, development of new refinery processes and construction of greatly expanded capacity equipped the industry to provide ample supplies of a wide range of high quality products to a world growing more dependent on petroleum.



Modern, well-equipped stations throughout the country provided a complete line of products and services for a motor vehicle population that grew larger with every passing year.

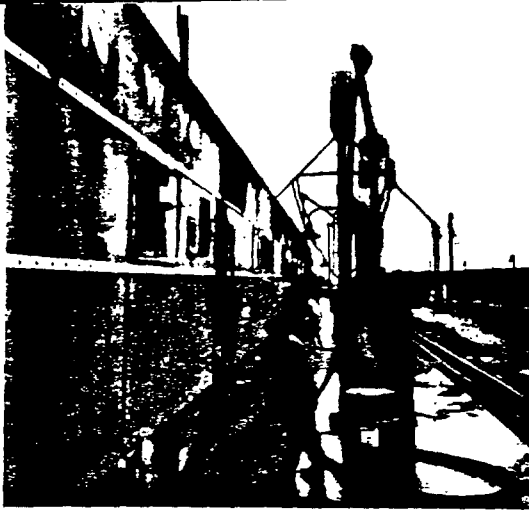


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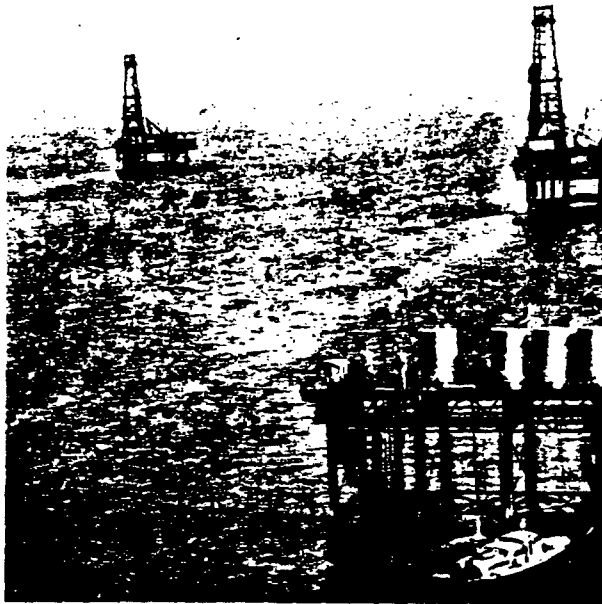
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With the almost complete disappearance of steam engines and the number of diesel-powered locomotives doubling, oil became the prime source of railroad as well as automotive and aviation fuel.

Right, the Fifties saw the development of offshore oil; the opening of the Williston Basin; North and South Dakota, Arizona, Nevada, Washington and Alaska added to the list of oil-producing states; and exploration and production stepped up around the world as oilmen sought to meet current and future demands for petroleum.

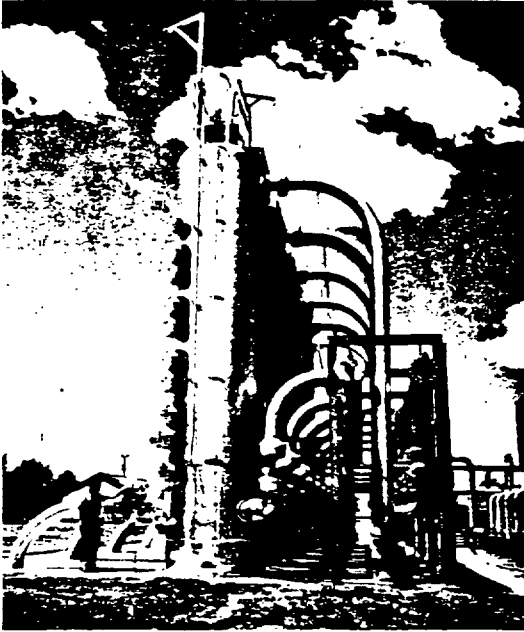


Below right, petroleum industry research facilities and know-how contributed to America's advances in the important new field of rocketry.

Below, synthetic fabrics with many highly desirable qualities were but one product of the fast-growing petrochemical industry which consumed increasing quantities of oil during the active decade.



OIL IN THE FABULOUS FIFTIES



Natural gas, represented here by a compressor station, came into wide use during the Fifties as an expanding pipeline system brought the fuel to many sections of the country. The oil industry participated in a campaign to free natural gas prices from federal controls.

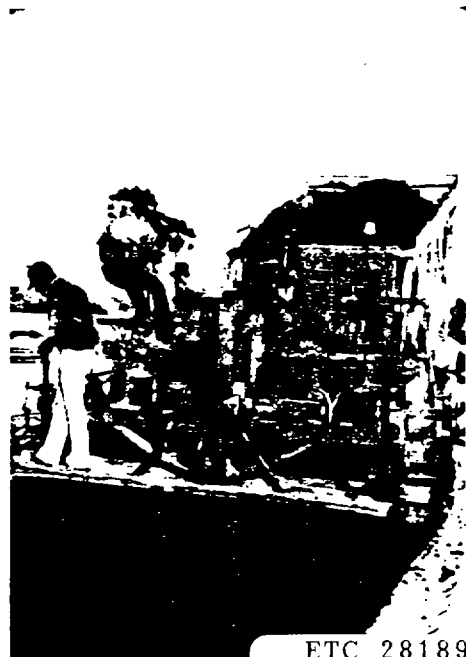


Petroleum transportation facilities experienced great growth as did all other branches of the industry. The ability to deliver large quantities of product over great distances was demonstrated when tanker-loads of oil were rushed to Europe following the Suez crisis.

The introduction of super-premium gasolines and the overall increases in octane quality of premium and regular grades typified accomplishments in keeping pace with automobile requirements.



Asphalt, an increasingly important product of petroleum, found more widespread use as thousands of miles of new pavement were laid in a record highway construction program.



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E. V. Murphree, of Esso Research and Engineering, and W. M. Holaday, of Socony Mobil, were among the oilmen who answered the call to government service and contributed their know-how to vital defense efforts.



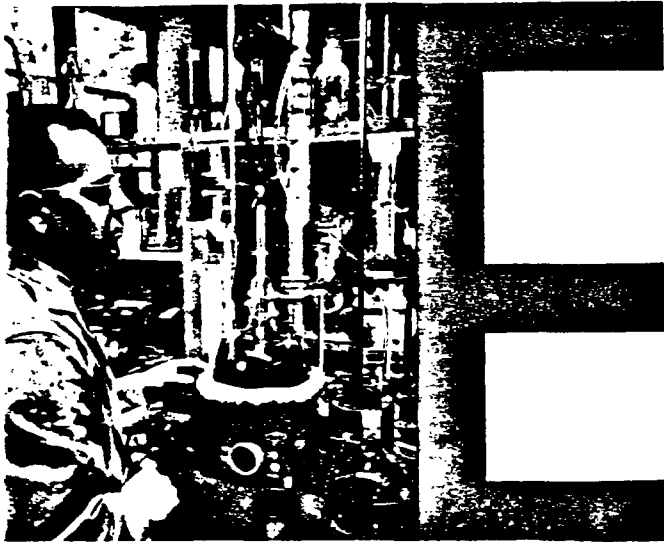
Experienced in supplying the critical jet fuel and lubricant requirements of the military, the industry was well equipped to satisfy the huge petroleum product demands of commercial jets when these sky giants went into service.

Skilled scientists used radioactive materials and other modern research tools to develop improved methods of finding petroleum deposits and to get more and better products from every barrel of crude oil.



The Drake well in Titusville, Pa., the industry's birthplace, was the focal point of the oil centennial celebration in 1959. Throughout the year, the story of oil's contributions was told to the public.





Ethyl in the Fabulous Fifties

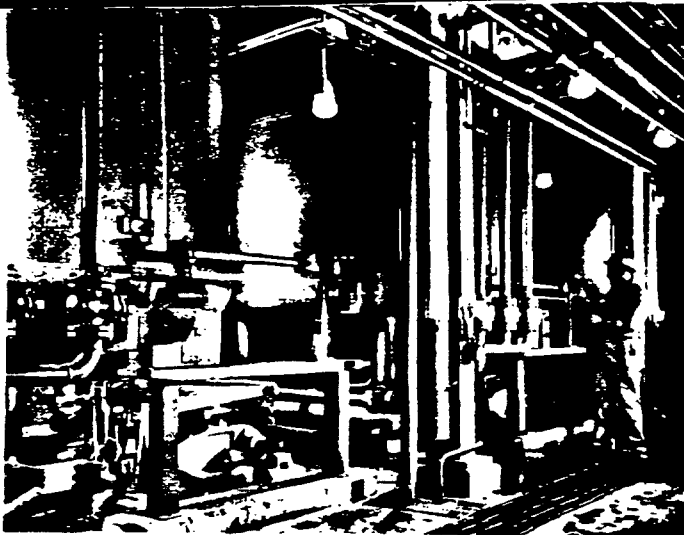
Product and service achievements marked the Company's continuous progress

ETHYL CORPORATION is completing a decade characterized by vigorous emphasis upon meeting needs of the oil, automotive, farm equipment, aviation and other industries. At the same time, the Company has drawn upon its unique skills to investigate additional chemicals with potential applications ranging from antibiotics to zirconium . . . New plants to supply "Ethyl" antiknock compounds were built at Houston, Texas, and Pittsburg, Cal. Facilities at Baton Rouge were enlarged. A special chemicals plant was acquired at Orangeburg, S.C. . . . Ethyl Corporation of Canada Limited was established as an affiliate, with its own plant at Sarnia, Ont., opened in 1956 . . . Better antiknock compounds introduced included Motor Plus and the newer octane-improver, Motor 33 Mix, containing manganese. Other new Ethyl products of the past 10 years combat pre-ignition in gasoline engines and improve diesel fuels. "Ethyl" Multi-Purpose Additive keeps fuel systems cleaner and prevents carburetor icing. New organometallic compounds were developed, including aluminum alkyls

and halides valuable as catalysts and intermediates. Antioxidants stabilize fuels and lubricants. Ortho-alkylation products offer promise as chemical building blocks. Vinyl chloride monomer for making plastics joined Ethyl's product stream at Baton Rouge last year . . . Market expansion and public relations efforts included such projects and promotions as The Story of Gasoline, Two Equals Three, Drive More, A New Concept of Gasoline Progress, and the Magic Circle . . . Gasoline quality surveys were broadened. Other services and facilities for customers ranged from field terminal expansion and a new gasoline testing laboratory to product sales clinics, presentations and training films . . . Ethyl cooperated in promoting higher compression-ratio tractors and publicized the economics of tractor operation . . . Company scientists gave more attention than ever to research and development on improving products and creating new ones. Pictures accompanying this brief summary of the past decade's highlights show some of the milestones which Ethyl achieved. #

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Left, scale tanks where antiknock fluids are weighed at Ethyl's first and largest plant to be built during the past decade. It was opened in the spring of 1952 on a Ship Channel site at Houston, Texas.

Below, the newest Ethyl plant at Pittsburg, Cal., began deliveries to western refiners last year. Efficiently modern, it closely resembles the new Ethyl of Canada Limited plant at Sarnia, Ont.



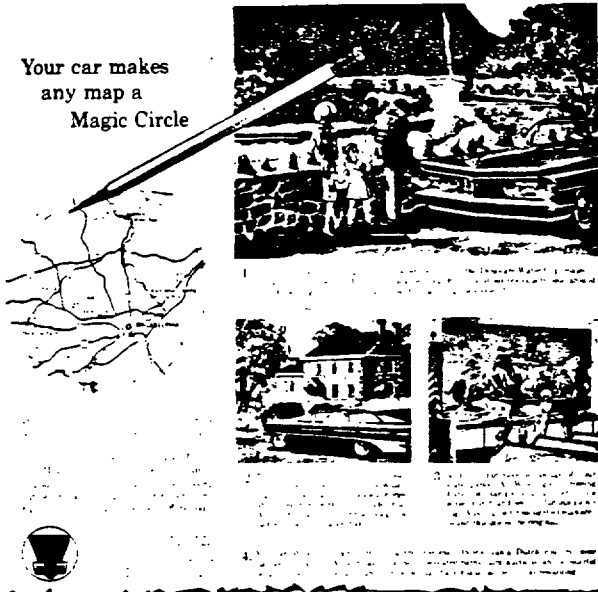
This unit for making vinyl chloride monomer, a plastics intermediate, was added to manufacturing facilities at Baton Rouge, La., the Company's largest plant.



Right, a group of oilmen attending one of many Ethyl-sponsored meetings designed to help them solve industry problems. Among those held in the past 10 years were product sales clinics, such demonstrations as "Fire Power" and educational films like "Danger!—Water!" and "You, the People," the latter reviewing natural gas issues.

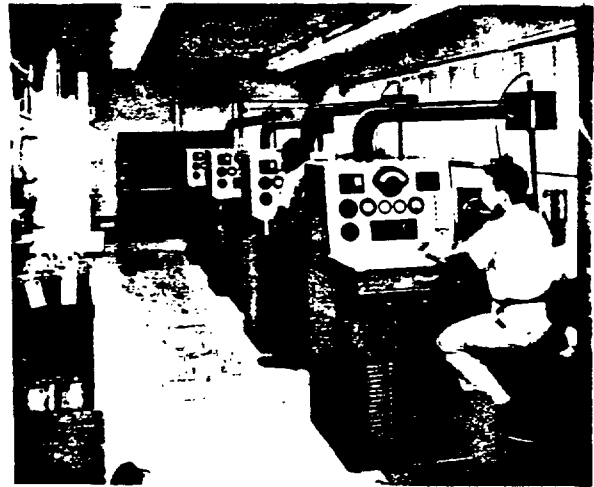
ETHYL IN THE FABULOUS FIFTIES

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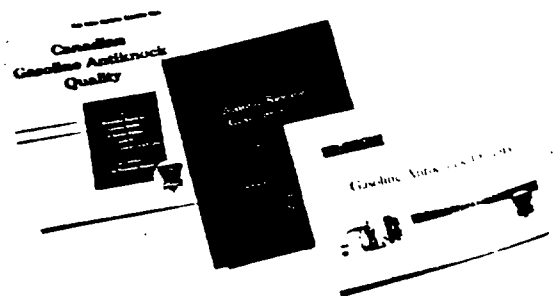


This Magic Circle advertisement is typical of Ethyl's market expansion projects and oil industry service and public educational efforts.

Installations of service benefit to refiners built by Ethyl during the Fifties included a new gasoline testing laboratory (below) and an experimental mixing plant, both at Houston; a terminal in Everett, Wash., and an office in Seattle; and additions to antiknock compound storage capacity at Edge Moor, Del. Products are now being shipped by a tank car fleet increased to more than 1,000 units.

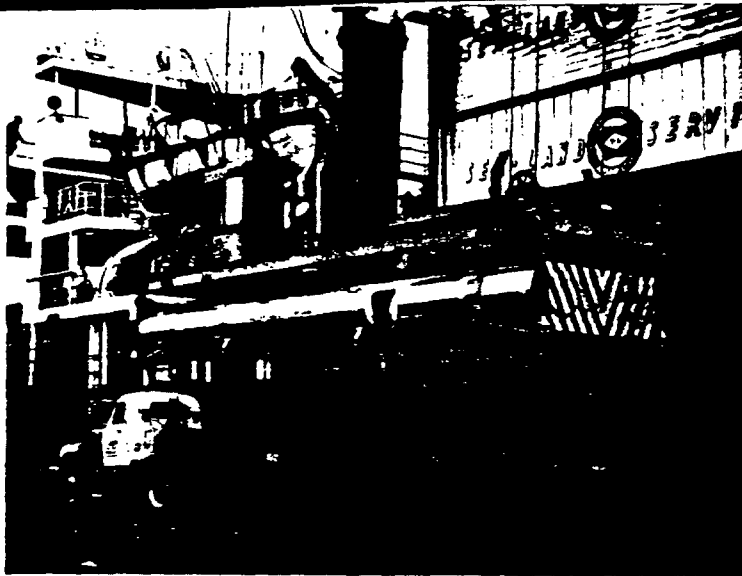


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Above, monthly as well as annual reviews of gasoline quality are among publications which have become more valuable to oilmen . . . Left, to help promote gasoline's usefulness on the farm, Ethyl cooperation brought about an experimental 12:1 compression ratio tractor, the XO-121, during the decade's middle years.

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After an experimental introduction by Ethyl in 1958, unique containers like this came into regular use to expedite and simplify the delivery of "Ethyl" antiknock compounds to customers overseas. Brought to dockside by trailer-truck, a filled tank is hoisted aboard ship by crane. After reaching its destination port, procedures are reversed.

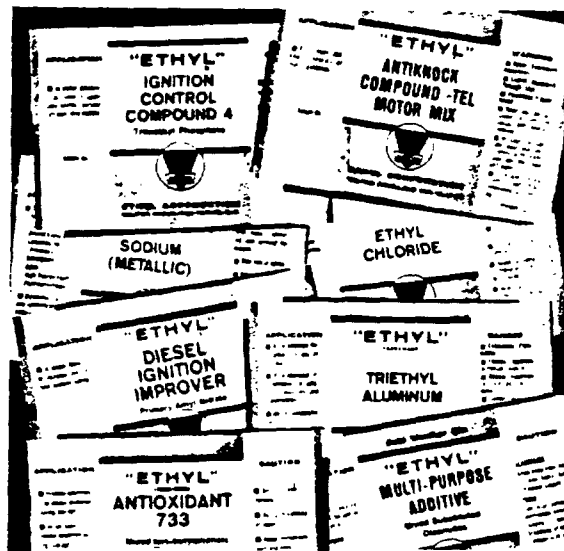


Right, Oklahoma Governor J. Howard Edmondson was among the hundreds interested in displays of Oil Americana from the unusually complete collection which Ethyl owns. Selected items were exhibited at key points such as Titusville, Pa., during 1959's Oil Centennial celebration.

A NEW CONCEPT OF GASOLINE PROGRESS

70% more work
18% less cost

Above, a ton-mile presentation developed by Ethyl which emphasized how modern gasoline does more work at less cost to the motorist was widely used by the industry as an effective public relations tool . . . Right, labels from a representative few of the Company's chemicals are an indication of how their number has grown in the past 10 years.





Oil Puts the Heat On



Fuel oil is currently supplying 44 percent

"Clear and cold as front moves in from Canada: strong northwest winds with gusts up to 50 miles an hour by nightfall. Minimum temperatures today, 10-12; high about 20. Increasing cloudiness tomorrow. Snow flurries likely in north portion."

EVEN WHEN FORECASTS such as this come more often, as the severity of winter increases, nearly everybody can count on being snug at home, thanks—in a growing number of cases—to efficient modern oil heat.

Indoor comfort during the cold weather is provided, of course, by three principal kinds of heat—oil, gas and coal—but oil is the leading fuel for domestic purposes, supplying about 44 percent of all heating energy, and its use is increasing. Gas provides some 33 percent. Coal, in third place, is burned in less than 15 percent of today's houses, as a result of the decline in its use that started when oil burners started to win friends in the 1920's.

Most oil-heated homes are in the northeastern quadrant of the United States where cold weather is prolonged and where over 60 percent of the population is concentrated. Gas is popular in the more temperate southern and south-central zones, while coal is still used where it is plentiful, easily obtained and inexpensive.

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percent of all domestic heating energy in the United States—and its use is increasing

Domestic heating is big business when measured by any yardstick. Estimates put the number of heated homes in the nation at 46 million, of which some 24 million have central heating systems. Owners will spend from \$5 to \$6 billion for fuels between now and next spring, with the average bill in the north totaling about \$225.

In most cases, automatic firing and temperature controls assure maximum comfort with minimum effort. Shoveling coal and dumping ashes are chores reserved for increasingly few householders these days.

Most of the more than 17 million homes burning oil have central heating systems rather than area or space units. It is oil's greater use in these systems that makes it the leading provider of total heat energy.

The reverse is true among domestic gas users. Most of them have area and room units. But the situation is by no means static and competition between oil and gas is reaching new peaks of intensity. Although the rivals concede equal thermal efficiency, each claims advantages in such respects as economy, convenience, dependability and safety.

Much of the competition involves vying for leadership in the new-home and conversion-from-coal markets.

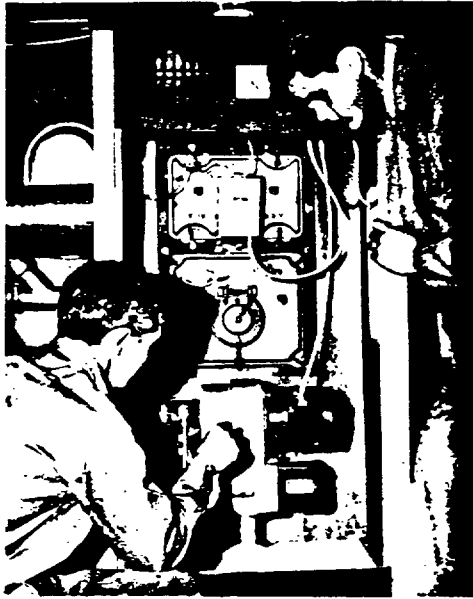
When most gas supplies were manufactured from coal, gas was never a serious threat to oil heat in these markets. But after World War II, with new pipelines bringing natural gas deep into oil burner territory, the growth rate of homes using oil decreased slightly for several years.

Now, however, this trend is being reversed. In some areas the sale of new oil heating systems is setting new records. National figures show that 16 percent more fuel oil was consumed in private homes in 1958 than in 1957—337,750,000 barrels as compared with 291,329,000.

Campaigning for Sales

Much of the credit for this brighter picture belongs to the National Fueloil Council, established a year ago as a market expansion agency. Financed by the companies which supply more than 70 percent of all fuel oil consumed east of the Rocky Mountains, the Council spearheads national campaigns and supports the sales promotion efforts of local dealers.

At least \$2 million was applied by the agency in 1959 for advertising and promotion assistance to back up marketers. This is more than twice the amount spent for similar purposes in 1958. The number of areas benefiting from Council support



Compact, efficient and economical, home furnaces burning oil usually need only routine adjustment before operating automatically all winter.



DEGREE DAYS

So that they can know when to make fuel oil deliveries to assure a comfortable supply in customers' storage tanks, most fuel oil dealers use the degree-day system.

One or more degree-days is recorded on any day on which the mid-point between the highest temperature and the lowest is less than 65° Fahrenheit. The number of degree-days that are recorded on any one calendar day depends on how many degrees less than 65° the mid-point is for that day. For example, a day on which the mid-point is 35° will be counted as 30 degree-days (the difference between 65 and 35).

By keeping a record of the degree-days for any given period and adjusting them to their individual customers' requirements, fuel dealers can estimate how much oil any one home has consumed and then know when a delivery is indicated.

has risen to 53 from 30 a year ago. Programs are being developed for 30 additional marketing areas—many of them in the Midwest as well as in the traditional Northeast.

The National Fueloil Council also has inaugurated a national communications program to publicize oil heat in newspapers, magazines, over TV stations, and via booklets and pamphlets.

Second Only to Gasoline

From the petroleum industry's standpoint, few undertakings are more important than successfully increasing the demand for domestic fuel oil. This is because domestic fuel oil is second only to gasoline as the principal product refined from crude. Therefore, gains in the fuel oil market play an important part in the industry's well-being.

That is why the National Fueloil Council and individual marketers are redoubling their efforts as the heating season plunges into its coldest months. After a mild fall in sections normally much colder, fuel oil stocks on hand amounted to nearly 180 million barrels in early November. This was 11 percent more than inventories at the same time last year.

But with 371,500 new domestic oil heating systems installed during the first eight months of 1959—an increase of 14 percent over 1958—it is anticipated that fuel oil demands will increase proportionately through the balance of the current heating season. At the same time, the sale of still more oil burners is continuing briskly.

New Burners Developed

Other factors that are contributing to oil's new strength on the home heating front include the development of new and more efficient oil-burning units. Research in the field is being pushed by refiners and equipment manufacturers. One radically new type has a burner with an invisible flame. Another innovation is an oil-fired hot water heater for household use.

These and related measures follow hard on the heels of such recent accomplishments as improving the quality of fuel oil. All these advances combined cut the average homeowner's current requirements to only about 1,458 gallons for a heating season, as compared with 1,832 gallons 10 years ago. In other words, he is using 374 fewer gallons and getting better heating results. #

Look to the Future

The countries that succeed in the world of tomorrow will be the ones whose people are being educated to think clearly and plan wisely



B. B. Turner

By B. B. Turner*
President, Ethyl Corporation

ONE OF THE GREATEST CHALLENGES facing America's colleges and universities today is to turn out men and women who not only have been trained along certain specific lines, but who also have been thoroughly educated to observe, to think, to plan and to work.

At no time in our history has there been a greater need for, or premium on, the ability to observe accurately, to think logically, and to plan with precision and vision for our country's future.

No matter what the world of tomorrow turns out to be, one thing is certain: it will demand greater mental effort on the part of all people. The countries that succeed will be the ones whose people are being equipped now to think accurately, to plan wisely, and who are willing to work for the future.

Unfortunately, there is a great tendency to devote much of our time to current problems. It's popular to talk about the inroads on our freedoms, the imbalance of power in certain organizations and political groups, and the many real dangers to world peace. But if we are going to prepare our country—not just for survival, but also for leadership in the future—we must concentrate on the research, the thinking and the planning that will be needed so vitally.

Charles F. Kettering, the great inventor and scientist liked to say, "We all should be concerned with the future; after all, we're going to spend the rest of our lives there."

By the year 2000, it has been predicted, the population of the United States will have soared to

*The accompanying article is condensed from an address by Mr. Turner before fellow-members of the Association of Rice Institute Alumni, in Houston, Texas, this November.



an estimated 320 million, with 85 percent of our people living in urban areas. Add to this the population increases that are going on all over the world—a total of 50 million a year at present rates—and it's quite apparent that life, indeed, will be more complex—from sheer numbers alone, if for no other reason.

It certainly is going to take some intelligent thinking and planning to satisfy the needs of the world's people and assure a reasonable amount of harmony. Almost two centuries ago, Thomas Jefferson issued the solemn warning that for a nation to expect "to be both ignorant and free, in a state of civilization" would be to expect "what never was and never will be."

Demands on the Mind

Success in the competitive world of tomorrow will place great demands on the minds of our people to think clearly, independently and unemotionally. This requires a knowledge of facts, ability to think out complex problems, and to come up with answers that will provide not only immediate solutions, but even more important, solutions that will hold up over a period of years.

In this connection, it is important to note how slight errors of deviation from intended courses frequently are amplified many times by the passage of time. A small mistake or error today can create a major problem tomorrow. It is not unlike a wide miss of the mark by a Cape Canaveral missile due to a fraction of a degree error in the angle of take-off.

Creating the research, the thinking and the planning teams that we need involves people and the training of people, and herein a major role is played by our colleges and universities. For certainly specialized training supplemented by liber-

al education is a prerequisite to clear thinking and planning. But training in the basic ability to think—regardless of the circumstances—is still the overriding consideration.

It is important then, that we distinguish between knowledge and intelligence; between technology and science. What we learn from books and other sources of information is useful knowledge. But we are constantly reminded that conditions are changing—whether we talk about the science of economics, the science of the atom, or the science of man himself.

As individuals, we must be prepared to adjust our own thinking rapidly in keeping with these changing conditions.

The ability to think clearly can mean the difference between success and failure—of an individual, of an entire corporation, or of a nation. Successfully anticipating the needs and wants of the future and developing new products to meet them requires the talents of many good minds. When we consider that as many as ten years might elapse between the inception of an idea and the appearance of a new product in the market place, it becomes obvious that long-range planning and foresight for future needs and wants are essential.

Thinking Men in Government

In the field of government, there is an even greater premium on sound thinking and planning. Actions there can affect an entire nation or the whole world.

Our country's founders demonstrated their exceptional ability along these lines when they framed the Constitution. That fundamental law of the land has, of course, survived two of the most volatile centuries in man's history. But the need for

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In any discussion of this type, where the present and future of our country are concerned, it has become almost inevitable for us to compare ourselves with Russia. In Russia, we are faced with a society that can and does direct its manpower as it chooses—with no regard for the hopes or aspirations of the individual. There is little doubt that for the present, at least, they are directing that manpower along specialized technical lines.

Limitations Evident

The question such a situation raises is this: In order to compete successfully with the Russians, should we reorient our educational system and place overwhelming emphasis on the scientific?

The impulse after the first Sputnik was hurled into orbit was, yes, we should match the Russians both in the emphasis on technical education and the direction of scientists along highly specialized lines. But with the passage of time, the many limitations such a system imposes on any society have become evident.

While our system can stand a lot of improvement, it still is the best one to insure our future success.

The main considerations are these: First, the loss of free thought and free choice of area of effort. In short, the loss of the privilege to think and act as an individual leads only to a second-rate society.

Second, all of the worthwhile developments that have taken place in our way of life have resulted from the coordination and melding of the contributions of a widely diverse assortment of talents of thinking people.

Although special emphasis can lead to outstanding achievements in

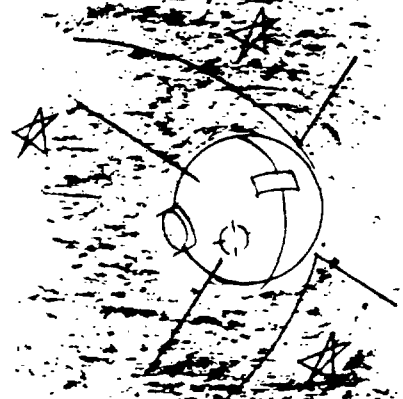
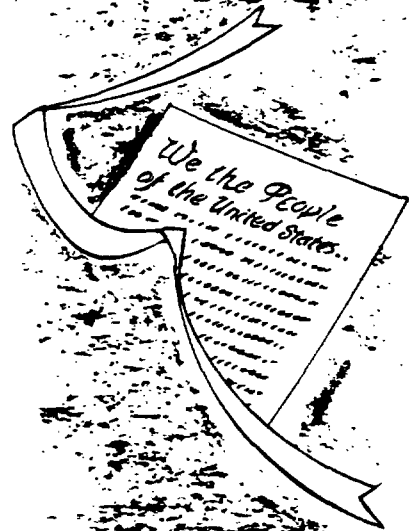
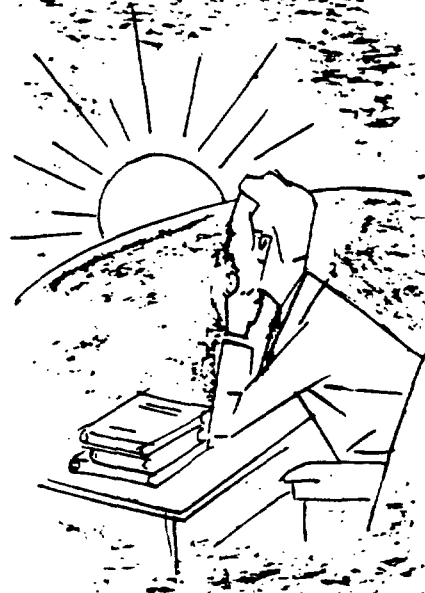
a given field, the end result is a lopsided society that smacks more of mere existence than it does of a full, well-rounded life.

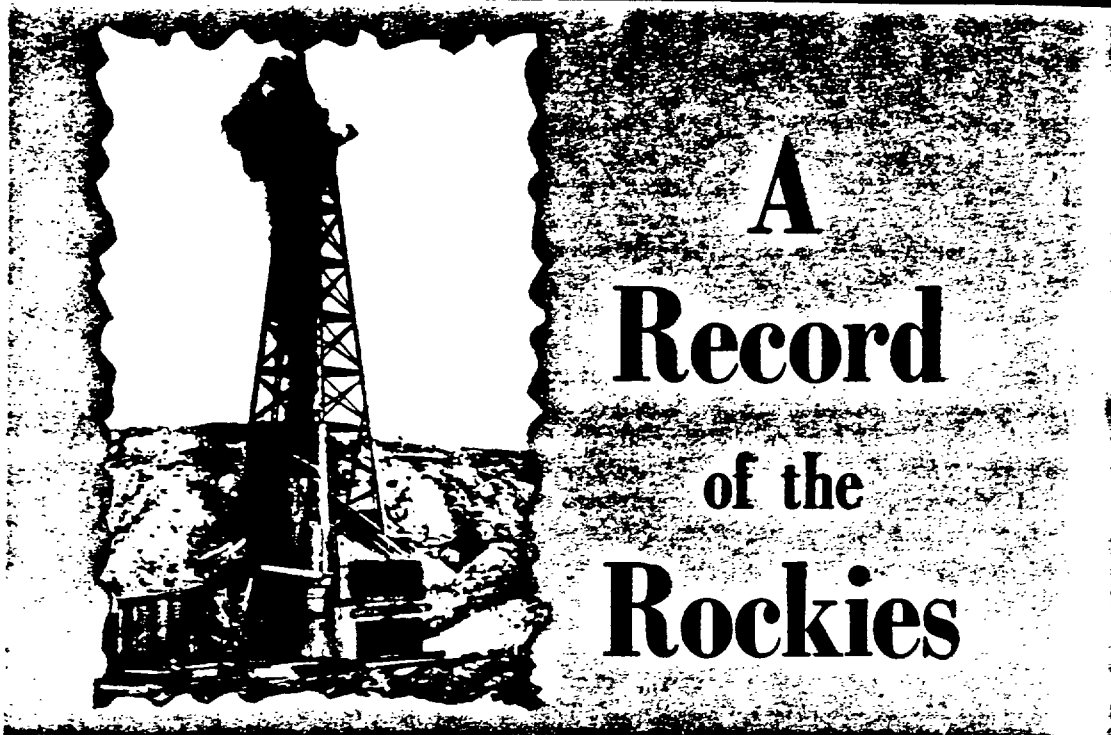
Vice Adm. Hyman G. Rickover, the father of the nuclear-powered submarine, has discussed this very subject. Admiral Rickover says: "A much higher quality of education is required to turn children into thinking men than to turn them into merely competent men. Democratic education must do both. Never before have we been in greater need of people capable of good hard thinking than we are today. Man rose from savagery by putting his mind to work. He has so remade the world that only the most intensive use of his brainpower can insure his survival in decency.

"In totalitarian countries a subject is properly educated when he has learned enough to do his work efficiently, whether as a typist, doctor or top scientist. In democratic countries, a citizen must learn all this and much more besides. He must prepare himself not merely for competence in his chosen calling, but must also learn to become a responsible citizen and contented human being. He needs to learn how to lead a good life no less than an efficient one. Above all, he must be taught how to use his mind independently so that he may be a free man."

Assuring Leadership

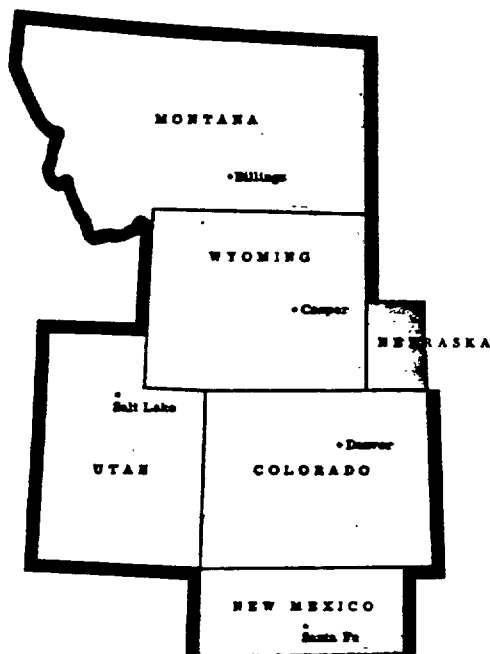
So, in our planning for the future, we must recognize our talents wherever they may be and in whatever fields they may lie. We must develop these talents the best way we know how, and above all, train the free individual to think for himself. Only by intelligent thinking that leads to intelligent action can we assure our nation's leadership in the world of tomorrow. #





A Record of the Rockies

A University of Wyoming research center is preserving historical oil documents



The Rocky Mountain region covered by the Petroleum History and Research Center includes Montana, Wyoming, Utah, Colorado and parts of Nebraska and New Mexico.

THREE YEARS and two thousand miles from the birth of the modern oil industry in western Pennsylvania, a veteran of the original oil regions opened up an entirely new petroleum producing area. In the spring of 1862, A. M. Cassedy, of Oil City, Pa., drilled the first oil well in the Rocky Mountain region, near Canon City, Col. Soon afterward a crude skimming plant also was started. These events touched off oil activity in what, over the years, has been one of the country's important producing and refining areas.

As the oil industry has been looking back in this centennial year to its birth and has paused to review its rapid development, a project started in 1956 is continuing its mission of preserving in detail the history of oil in the Rocky Mountain region. This project is the Petroleum History and Research Center at the University of Wyoming, in Laramie.

Two-fold Purpose

Not infrequently in recalling its phenomenal industrial growth, America has found that developments have come so fast that there was little time or inclination to preserve the records and manu-

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The Center's headquarters are in the William Roberston Coe Library and School of American Studies building on the University of Wyoming campus at Laramie . . . Left, archivist Gene Gressley collects historical data in an interview with Dr. Samuel H. Knight of the University's geology department. Dr. Knight's father was a pioneer Rocky Mountain geologist.

scripts necessary to a proper telling of its story. It is to prevent this from happening to the history of oil in the Rocky Mountain states that the Petroleum History and Research Center was established three years ago. Specifically, the two-fold purpose of the Center is (1) to collect historical data such as manuscripts, business records, diaries and tape-recorded interviews, and (2) to preserve these materials and use them as source material in compiling a comprehensive story of the oil industry in the area.

Just as it does in so many other places, the real history of oil in the Rocky Mountains goes back beyond the beginnings of actual operations, the Center has found. Indians are reported to have told white fur traders of the existence of an oil seepage near Rozel, Utah, early in the 19th century. The first recorded mention of oil told of an oil spring near Lander, Wyo. It was in the journal of Capt. B. L. E. Bonneville, in 1832.

Two years after the Cassedy well of 1862, pioneers pushing westward saw oil seepages where the Bozeman trail crossed the Little Big Horn River in Montana. Some of the other highlights of the Rocky Mountain oil story are found in the discovery and development of the Salt Creek field in Wyoming, the Cat Creek field in Montana, the Hogback field in New Mexico, the Rangely field in Colorado, the Four Corners territory, and in the construction of refineries, pipelines, and other producing, transporting, refining and marketing facilities.

Appropriate Location

These and all other phases of the Rocky Mountain oil industry are grist for the Petroleum History and Research Center mill.

The University of Wyoming campus is an appropriate location for the project for several reasons. Currently, Wyoming is the largest oil produc-

ing state in the Rocky Mountain region. The University's geology department is recognized as one of the best in the country. The new geology building and new library provide good facilities for such a center. Another factor is the location on the campus of offices of the United States Bureau of Mines and the National Resources Institute, both of which contain valuable information relating to the oil history of the region.

Sizable Collection

The Petroleum History and Research Center has already amassed a sizable collection of historically significant materials, including old photographs, documents, papers, business records and manuscripts. Its ambitious personal interview program has so far resulted in some fifty tape-recorded talks with men who helped develop the oil industry in the Rocky Mountains. Among them are such na-

tionally known figures as Frank Prior, board chairman of Standard Oil Company of Indiana; W. L. Connelly, retired Sinclair Oil Company board chairman; R. A. Carter, president of Tuloma Gas Products Company; C. E. Beecher, vice president of Cities Service Oil Company; C. E. Reistle, executive vice president of Humble Oil & Refining Company; Fred E. Smith, retired vice president of The Ohio Oil Company; and E. S. Murray, vice president of Tennessee Gas Transmission Company.

The tape-recorded interviews generally last about three hours. Many more hours are spent transcribing and checking them before they become a permanent part of the Center's source files.

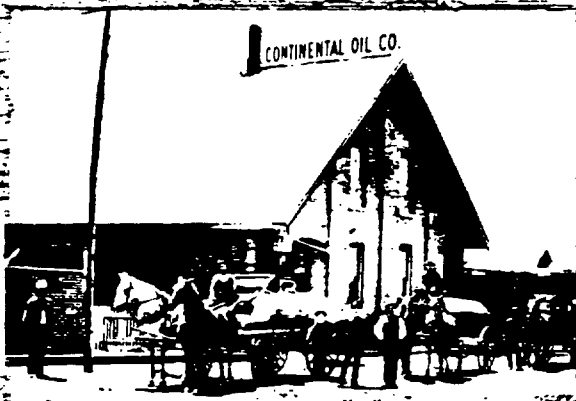
Many companies have made financial contributions or turned over historical material to the project. Among them are Ohio Oil; Humble Oil & Refining; Standard of Ohio; Sunray Mid-Continent; El Paso Natural Gas; Kerr-McGee; Shamrock Oil;

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SOME PICTURES FROM THE PAGES OF COLORFUL OIL



Drivers lined up horse-drawn rigs, wagons for the photo of Continental Oil's Denver headquarters in 1890.



The cable tool drilling rig was used in the Elk Basin to locate traps of Pecos, West in 1872.

The oil and automotive industries and public are all interested in . . .

NOW THAT the widely heralded compact cars have not only put in an appearance but have become a relatively common sight, people everywhere have had a chance to see what they look like and to learn something of what they will do. Several questions about them remain, however.

Just how compact are they?

How will they affect the automobile market this year and in the future?

What effect will they have on the petroleum industry?

To find the answer to these questions, it might first be helpful to take a look at the package size of the new compact cars.

Many people thought that these cars were going to be much smaller than they actually turned out to be. Using average specifications of the six-cylinder 1959 Chevrolet, Ford and Plymouth as one standard and the average specifications of the Volkswagen and the Renault Dauphine (the two most popular foreign cars in the United States) as the other, some meaningful comparisons can be made.

Between Foreign Cars and U.S. Six

The wheelbase of the compact car is 10 inches shorter than the average Big Three six-cylinder car, but is 16 inches longer than that of the foreign cars. By using much shorter overhangs, the compact car is made 29 inches shorter than the U. S. six, but it still is 22 inches longer than the foreign car. The weight of the compact cars is 30 percent less, while the foreign car is 57 percent lighter. From a size and weight standpoint then, the compact car falls about halfway between the small foreign car and the U. S. six.

The six-cylinder compact car engines are about one-third smaller in displacement and horsepower than the American sixes, while the four-cylinder foreign car engines are only about one-fourth as large as the U. S. six. This gives the compact car about the same power-to-weight ratio and accelerative ability as the U. S. six. Because of the small

The Impact of the Compact Car

engine used in the foreign car, it requires 75 percent more time to reach 50 mph.

From an economy standpoint, the U. S. six with a manual shift averages about 16 miles to a gallon. The compact car, because of its reduced weight and smaller engine size, gets about 24 miles to a gallon, or 50 percent more. The small foreign car, on the other hand, gives about twice the fuel economy of the U. S. six.

Compact Car More Efficient

A comparison of these fuel economy figures with the weight and performance of the cars indicates that the compact car engine is more efficient than the foreign car's. Part of this improved efficiency is due to a higher compression ratio and higher fuel requirements.

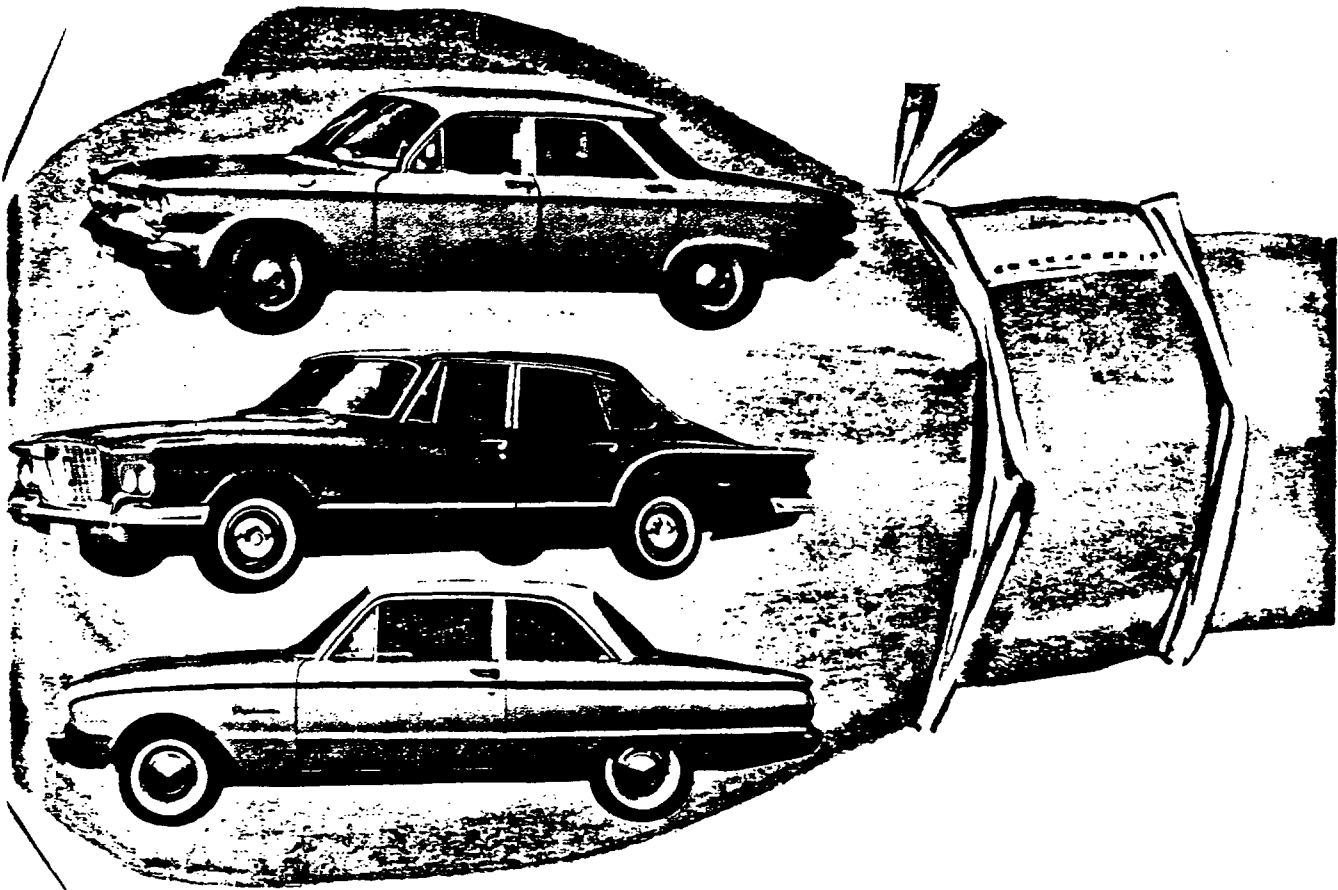
When it comes to compact car specifications, it is readily apparent that the Chevrolet Corvair is a rather unconventional automobile by U. S. standards. It is powered by a six-cylinder-opposed pancake, air-cooled engine, mounted in the rear. The

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engine uses a die-cast aluminum crankcase and cylinder heads, while the cylinder barrels are finned cast iron.

The Ford Falcon and Chrysler Valiant, on the other hand, have fairly conventional six-cylinder, in-line, water-cooled, cast iron engines. All three are modern-design, big-bore, short-stroke engines with overhead valves.

The wheelbase and overall length of all three cars are nearly the same, about 108 and 180 inches, respectively. The roof line dimension has been reduced to as low as 52 inches on some models.

The weights are all very nearly the same, with the Corvair the lightest because of its aluminum air-cooled engine. All three cars have unit frame and body construction. Manual shift transmissions

are standard equipment, with torque converter automatic transmissions optional.

With this background in specification, it might be well to turn to anticipated sales volume.

While all of the automobile companies have made extensive market surveys, they are not agreed on who all the potential compact cars buyers are and will be. Are the new models taking customers from the U. S. six-cylinder market, the Rambler or Studebaker Lark, the foreign car, or the larger U. S. V-8?

For the purpose of this article, any car with a wheelbase of less than 110 inches is considered a compact car. Using this standard, it is found that 4.3 percent of total U. S. automobile sales in the 1957 model year were compact cars. This figure



All of the compact cars have newly designed engines for which regular grade gasoline has been specified.

rose to 11.2 percent in the 1958 model year and to 16.2 percent in the 1959 model year. In 1957 and 1958, compact cars were 70 percent imports and 30 percent Ramblers. In 1959, 50 percent were imports, 37 percent Ramblers and 13 percent Larks.

For 1960, it has been estimated—subject to the effects of the steel strike—compact cars will account for about 25 percent of all automobile sales in this country. About 40 percent of the compact car market is expected to be “Big Three” compact models (Corvairs, Falcons, Valiants and Comets), 30 percent imports and 30 percent Ramblers and Larks.

The big question is: What will happen to compact car sales after 1960?

It is generally known that General Motors is tooling up to build Buick, Oldsmobile and Pontiac compact cars for the 1961 market, and Ford's Lincoln-Mercury division is expected to introduce the compact Comet during the first half of 1960. If the sale of compact cars is good, then the standard size of U. S. cars may be made more compact.

Comparison of Compact, Foreign and U. S. Cars

	U. S. "6"	Compact	Foreign
Wheelbase	118 in.	- 10 in.	- 26 in.
Length	210 in.	- 29 in.	- 51 in.
Weight	3,570 lbs.	- 30%	- 57%
Displacement	229 cu. in.	- 32%	- 73%
Horsepower	137	- 32%	- 75%
Lbs. per hp.	28	+ 7%	+ 93%
0-50 mph.	12 sec.	same	+ 75%
Economy	16 mpg.	+ 50%	+ 106%

By using many of their existing components, the reduction in size can be accomplished during model changeover without extensive extra retooling.

By 1962, the sharp line of demarcation between the size of present U. S. cars and compact cars may well be substantially reduced or eliminated. The buyer would then have a complete selection of car sizes from the miniature foreign cars, such as the Fiat 500, to the largest American-made cars.

Now let's examine the anticipated impact of the compact car on the petroleum industry.

All of the compact cars have newly designed engines for which regular grade gasoline has been specified. The designers knew that the American public was expecting a substantial gain in economy. To get the high efficiency on regular grade fuel, the designers used compression ratios that took advantage of all the antiknock quality available in regular gasoline.

Compression Ratios to Rise

In their introductory year the designers have been conservative and have designed for requirements higher than the U. S. six-cylinder cars but lower than some of their regular grade gasoline V-8's. As they get more experience with these engines, the compression ratios and requirements probably will be raised—particularly if regular fuel quality becomes more uniform throughout the country.

It was indicated previously that the new compact cars have a 50 percent increase in fuel economy over the U. S. six and an even greater gain over the typical V-8. How will this affect gallonage?

To the average owner of one of these cars, this fuel economy represents fuel savings of about \$60 a year. From the petroleum industry standpoint, by the end of 1960 the U. S. car population probably will consist of approximately six percent compact cars. These compact cars will reduce U. S. passenger car gasoline consumption by about two percent below what it would be if the entire population were made up of standard size U. S. cars.

By the end of 1965, the U. S. automobile population may have as many as 20 percent compact cars. In this situation, gasoline consumption would be reduced by 6.5 percent over an “all U. S. standard-size-car” population. However, total gasoline consumption will still be greater than it is today because of expected car population increases. =

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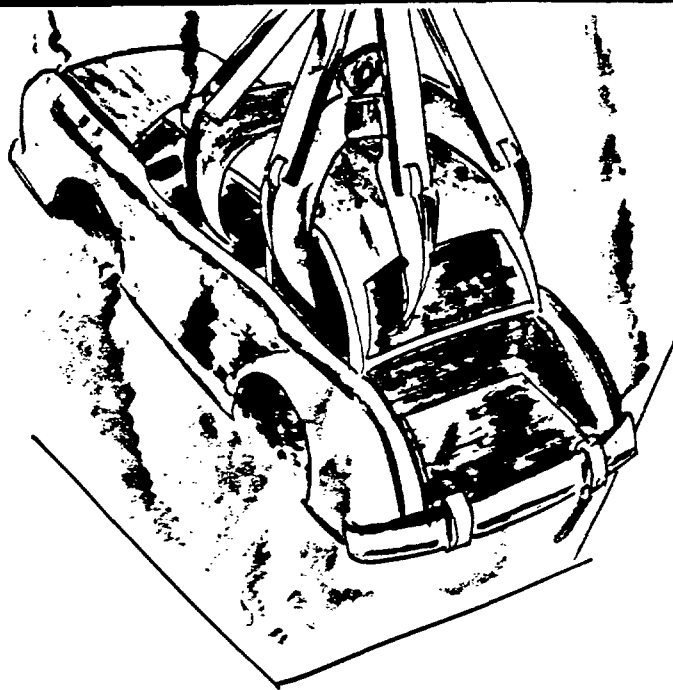
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Old Autos Never Die



Their metal components, salvaged as scrap, are recast into steel for new models

By Stanton P. Nickerson

JUST AS DELICIOUS TURKEYS on holiday tables wind up as broken bones, once-glittering cars of yesteryear are reduced eventually to an equally depressing condition: scrap metal.

But unlike drumsticks and most other discards, the automobile which has outlived its usefulness is far from a total loss. Furnaces and mills turning out steel for every purpose are hungry for the bodies, frames, and other parts of scrapped vehicles.

So basic is this vast appetite for apparently useless cast-offs that as a whole, the steel industry in normal times combines nearly a ton of scrap with a ton of pig iron in its everyday production. Metals which have been refined before contain few impuri-

ties, and so reprocessing them helps cut costs and promotes the quality of newly cast ingots.

During 1958 the steel industry consumed 44 million tons of scrap. The principal sources for used metals included some 4,400,000 cars, trucks and buses resurrected from motorized transportation graveyards. Other substantial supplies came from old industrial equipment and machinery, demolition left-overs, the railroads and shipyards.

Detroit's assembly lines, of course, are the principal consumers of new steel. Therefore, when the purchaser of a new car drives proudly home, it probably contains at least some elements of an earlier model. In other words, partial reincarnation by modern industrial alchemy awaits the most hopeless jalopy.

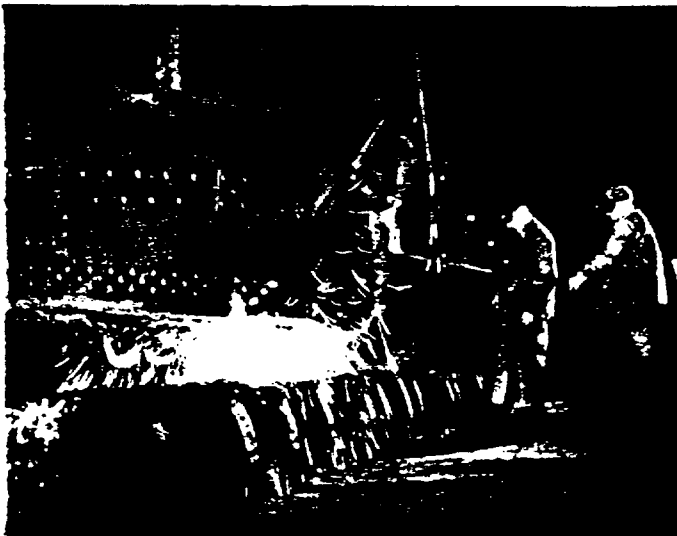




Workmen removing non-ferrous metal parts from an old car before it becomes scrap for reuse in making steel.



After being incinerated, yesteryear's automobiles are reduced to smoking blocks of scrap steel in huge hydraulic presses.



Close to a ton of scrap is combined with every ton of pig iron as furnaces and mills produce new steel. In 1959, outmoded vehicles were a major source of supply.

In the scrap business, owners and operators of yards or lots where motorists dispose of their derelict transportation are known as auto wreckers. There are close to 5,000 of them throughout the United States, according to the Institute of Scrap Iron and Steel. Some 2,000 dealer-processors take over the old cars next, removing everything not made of steel. Most engines, for example, go to iron foundries.

After processing and packaging his battered wares, the dealer either sells reclaimed steel directly to a mill or through a scrap metal broker.

Steel Worth \$10 Million

Discarded vehicles last year were the source of three million tons of steel worth close to \$10 million. Useful scrap per car varies with the make and model, ranging up to 3,500 pounds for a heavy sedan. Regardless of its condition, the price a dealer pays for an outworn automobile is governed by its scrap value to the steel industry.

Thanks to a sizable demand in the second-hand market, many enterprising auto wreckers do a brisk

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supplementary business in used parts. Such components as radiators, generators, carburetors and transmissions are repaired, reconditioned and sold. Occasionally an amateur mechanic will salvage two or three similar old models and build a "new" automobile with their best elements.

Cars and trucks reach their last parking places largely after a combination of old age and long service. Most of those with no value except as scrap are between nine and 10 years old, have been driven about 100,000 miles and have had five or six owners. Second hand parts are taken most often from cars damaged in accidents, and from other comparatively newer makes which have been subject to less wear and tear.

Modern Cars Last Longer

Improvements introduced by the automobile industry and its suppliers are responsible for giving today's cars considerably more durability than earlier ones. The Automobile Manufacturers Association finds that car life has increased by 71 percent within the past 30 years. This longevity has been accompanied by 304 percent more mileage accumulated before the average scrapping time.

Seasons and the weather influence times of peak activity for auto wreckers and scrap metal dealers. Business usually accelerates the most at this time of year, influenced by freezes and snow storms.

Many owners of decrepit vehicles prefer to sell them for scrap now and acquire later models, rather than undergo the expense of reconditioning "has-beens" for winter and buying new registration plates for them. Another spurt takes place in the spring among motorists wanting better transportation for warm weather service and enjoyment.

Need Technical Skill

Far from being the disorderly kind of enterprises they seem to the casual observer, scrap car businesses require a large measure of technical skill and acumen for successful operation. Knowledge of metals is particularly essential.

Reducing old cars to metals alone used to be accomplished by burning them at outdoor lots. This preliminary job is now done more efficiently with incinerators, which also eliminate air pollution and fire hazards in built-up areas.

Certain non-ferrous metals like zinc, copper and aluminum are "poison" to steel furnaces and so

parts with any such contamination must be weeded out. On the other hand, segments containing steel alloyed with nickel, chromium or molybdenum are particularly valuable. These too are segregated.

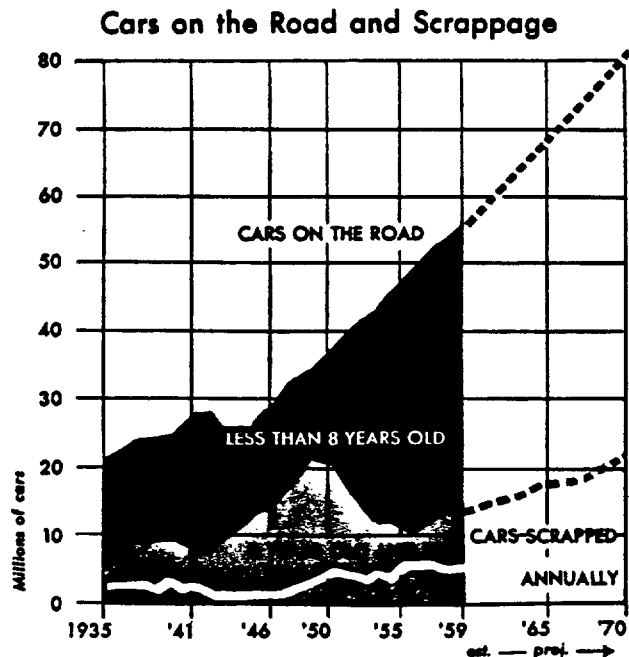
The body, in many cases complete with frame, is crushed by massive oil-hydraulic presses into blocks weighing from 1,000 to 2,000 pounds, which are shipped to steel mills for addition to pig iron in process furnaces.

Future Reincarnation

This is what is happening currently to most cars which were Detroit's latest and best in 1950 and earlier. In 10 years or so, reincarnation will be underway for today's cars, as inevitable obsolescence and wear qualify them only for scrap.

Auto wrecker yards and scrap dealers evaluate their future business prospects in direct proportion to new car production. Because everything on wheels must wear out some day, and with a predicted 80 million vehicles on the road in 1970, by that time almost seven million cars and trucks per year will be undergoing transformation into steel for the still better models of tomorrow. #

As the car population grows, the number eight years old or more, ripe for discarding, will increase proportionately. The chart below shows how scragpage is to approach seven million units by 1970.



Experienced Men Named to Ne

Eleven veteran employees fill key posts in Ethyl Corporation and Ethyl Cor

ELEVEN MEN, all of whom have long experience in the sale of "Ethyl" products, have recently been appointed to key positions in the sales departments of Ethyl Corporation and Ethyl Corporation of Canada Limited. The organizational changes in the two companies are part of continuing efforts to serve customers more effectively.

In the United States, changes include promotions and reassignments of responsibilities, according to Malcolm P. Murdock, Ethyl Corporation vice president in charge of sales. Ethyl Corporation of Canada has established two divisions and appointed divisional managers, who will be responsible to H. J. Philp, sales vice president.

ETHYL CORPORATION

Named general sales manager of Ethyl Corporation, with headquarters in New York, is S. T. Pruitt. In his new position, Mr. Pruitt is in charge of all domestic sales to oil companies and has overall responsibility for sales operations and advertising and sales promotion divisions. Mr. Pruitt, who

S. T. Pruitt
General Sales Manager



Stuart Forbes
Domestic Sales
Manager

joined Ethyl in 1930, has been domestic sales manager for the last four years.

His successor as domestic sales manager is Stuart Forbes. Mr. Forbes, who has been manager of the Central region, with headquarters in Chicago, began his Ethyl career in Atlanta 21 years ago.

Russell B. Weston, manager of advertising and sales promotion for the past 13 years, has been appointed director of both activities. The new advertising manager is J. B. Lonergan, who has been assistant manager since 1957.

Russell B. Weston
Director, Advertising
and Sales Promotion



James B. Lonergan
Advertising Manager

The new Central region manager in Chicago, succeeding Mr. Forbes, is Donald S. Flynn. Mr. Flynn has been assistant manager of Ethyl's Eastern region since 1952, with offices in New York.

Replacing Mr. Flynn as assistant manager of the Eastern region is R. D. Bushell, former New York district manager. William J. Rusher, account representative in the New York district, has been appointed New York district manager, succeeding Mr. Bushell.

William K. McCulloch, assistant to the sales vice president, is filling the newly created post of sales manager for petroleum additives. He is a former

New Sales Positions

Ethyl Corporation of Canada Limited



Donald S. Flynn
Manager
Central Region



Redgnald D. Bushell
Assistant Manager
Eastern Region



William J. Rusher
Manager
New York District

assistant advertising and sales promotion manager, and has been employed by Ethyl since 1932.

In another new position, administrative assistant to the sales vice president, is C. Fred Naylor, formerly manager of sales personnel development.

C. Fred Naylor
Administrative Assistant
to Sales Vice President



William K. McCulloch
Sales Manager
Petroleum Additives



ETHYL CORPORATION OF CANADA

The requirements of its business have prompted Ethyl Corporation of Canada Limited to establish Eastern and Western divisions to handle the sale of antiknock compounds manufactured at the Company's plant in Sarnia, Ontario. Fort William, Ontario, is the geographical dividing point between the two areas. Eastern division headquarters are in Toronto, where the Canadian company's home offices are located. The new division's manager is James H. Main. The western division, headed by Frank G. Huyler, has its headquarters in a new office in Calgary, Alberta.

As senior sales representatives, the managers of the new Ethyl Corporation of Canada divisions have been concerned with the sale and servicing of "Ethyl" antiknock compounds in Canada for more than 10 years. #



James H. Main
Manager
Eastern Division



Frank G. Huyler
Manager
Western Division

New Plant Boosts Ethyl's Aluminum Alkyl Capacity

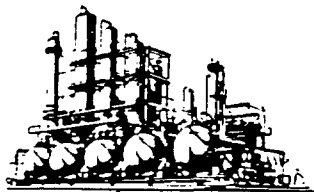
COMPLETION of a new plant at Orangeburg, S. C., has increased Ethyl Corporation's commercial capacity for making aluminum alkyls and alkyl aluminum halides. These organometallic compounds are used as catalysts in the manufacture of polyolefins and in the hydrogenation of aromatics. Some also show good promise as intermediates in the production of other chemicals and as pyrophoric (self-igniting) fuels for military applications.

The new plant is said to be the first major installation for the production of aluminum alkyls completed in the United States. It utilizes several methods for producing the various alkyl aluminum compounds, including a triethyl aluminum process developed by Ethyl.

The plant's multi-million-pound per year capacity enables Ethyl to offer a complete line of aluminum alkyls and alkyl aluminum halides. These include triethyl aluminum, a mixture of triethyl aluminum and diethyl aluminum hydride, triisobutyl aluminum, trimethyl aluminum, diethyl aluminum chloride, ethyl aluminum dichloride, ethyl aluminum sesquichloride, methyl aluminum sesquichloride, and methyl aluminum sesquibromide.

Commercial development of the alkyl aluminum compounds is an outgrowth of the pioneering work of Dr. Karl Ziegler, world-famous chemist and director of the Max Planck Institute for Coal Research at Mulheim, West Germany.

More than 100 companies have purchased aluminum alkyls and alkyl aluminum halides from Ethyl, either in commercial or development quantities, since the Company began marketing them a few years ago. Shipments from the new plant range in size from one-half pound samples to 1,400-pound and larger commercial quantities in specially-designed containers. #



Exotic Fuels Offer Promise of Small, Powerful Engines

THE SO-CALLED EXOTIC FUELS offer the promise of smaller, more powerful engines for aircraft, missiles, and space vehicles, Dr. H. A. Beatty of Ethyl Corporation's research laboratories in Detroit told the southwestern regional meeting of the American Chemical Society in Baton Rouge, La., in December.

Dr. Beatty noted that high-energy and pyrophoric (self-igniting) fuels containing boron or aluminum can release their energy more rapidly than can the more-conventional hydrocarbon fuels. This results, he said, from higher heat of combustion or higher flame speed or both. These fuels would require relatively little modification of existing engines, such as the turbojet afterburner or ramjet, and would improve engine performance.

The potentialities of combination fuels also have not been exploited, Dr. Beatty said. For example, auxiliary injection of a pyrophoric alkyl aluminum fuel into a hydrocarbon-air mixture would improve combustion, and thus raise power output.

Dr. Beatty was one of seven members of Ethyl's Research and Development department—two from the Company's research laboratories in Detroit and five from Baton Rouge—who presented papers at the ACS regional meeting. #

Company President Elected to API Board of Directors

ETHYL CORPORATION PRESIDENT B. B. Turner was elected to the board of directors of the American Petroleum Institute at the organization's 39th annual meeting in Chicago in November. Mr. Turner also was named to the general committee of the Division of Refining.

In addition, Thomas J. Davis, the Company's general traffic manager, was selected for membership on the Committee on Railroad Transportation of the API Division of Transportation and was elected a member of the board of directors of the Transportation Club.

Some 30 other Ethyl representatives are continuing their work on more than 40 different API committees. #

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Fifteenth Century Oilman

IN THE CENTENNIAL YEAR of the modern oil industry, it has been interesting to look back—not just 100 years to the Drake well—but hundreds of years to the part petroleum played in antiquity. One fragment that contributes to an overall picture of ancient oildom is the accompanying woodcut of a medieval producer. The original appeared in *Ortus Sanitatis* (The Garden of Health), a Latin volume of the late 1400's and early 1500's. Since the art of printing had been in existence only a few decades, it is believed that this is the first printed picture of an oilman.

This reproduction has been made directly from a 1517 edition of *Ortus Sanitatis*, printed in Strasbourg, France. The book is a part of Ethyl Corporation's collection of historical oil documents.

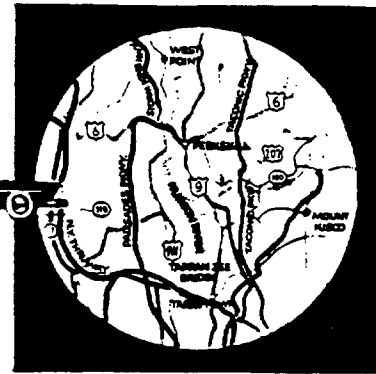
With knowledge of petroleum so limited in those days, it is possible that the artist was inspired by the Bible verse, "The rock poured me out rivers of oil" (Job 29:6). In showing a contemporary

oilman gathering crude petroleum in an earthenware vessel at a rock spring, he must also have been guided by the book's Latin text. In part, it reads: "Petroleum is the oil of rock. . . . It is formed when the fat and heat of the earth, by the action of water, are turned to fiery parts. It is found on rocks, it exudes from them. . . ."

Apparently one of the 15th century oilman's principal markets was in the medicinal field, for the author of *Ortus Sanitatis* credits petroleum with beneficial properties in the treatment of pains in the ears, film of the eyes, asthma, coughs, pains in the stomach, and punctures of the skin. Some 350 years later, petroleum still was being offered as a "cure for nature's ills"—by Samuel Kier, the Pennsylvania entrepreneur. But in the single century since 1859, the industry has made such progress that today there is practically no field that does not benefit from the contributions of the modern oilman.

Your car makes any map a Magic Circle

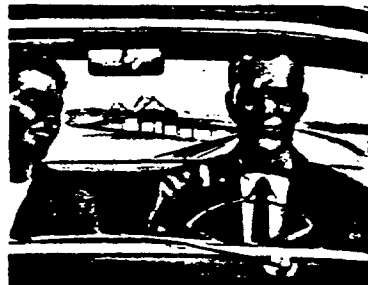
TAKE THE MAP AT THE RIGHT, showing the Magic Circle of the lower Hudson Valley. It's full of free-wheeling, high-spirited fun along any road you drive. And take *your* area. With a map and car keys, you'll find the same kind of fun surrounding *you*.



2. Viewing the valley from Monument Walk at West Point, you see why New Yorkers make the drive again and again. Roads like this make any place on your map a place to go—whether you've "already been there" or not.



3. Family history lessons are another reward of exploring, when you find bits of history like this early kitchen at Philipse Castle, Tarrytown.



4. The new Tappan Zee Bridge near Nyack is typical of road-building everywhere—making it ever easier to enjoy your Magic Circle.

1. What can beat a family picnic? This secluded spot is one of hundreds along the Hudson, and there's one just as relaxing anywhere you drive.



Take a pencil and map out your own Magic Circle. When you explore it, you take advantage of the best investment in fun you ever made—your car.

IT'S FUN TO EXPLORE YOUR MAGIC CIRCLE



ETHYL CORPORATION
New York 17, New York

Manufacturers of "Ethyl" anti-knock compounds
... used by oil companies everywhere
to improve their gasolines and your driving pleasure

